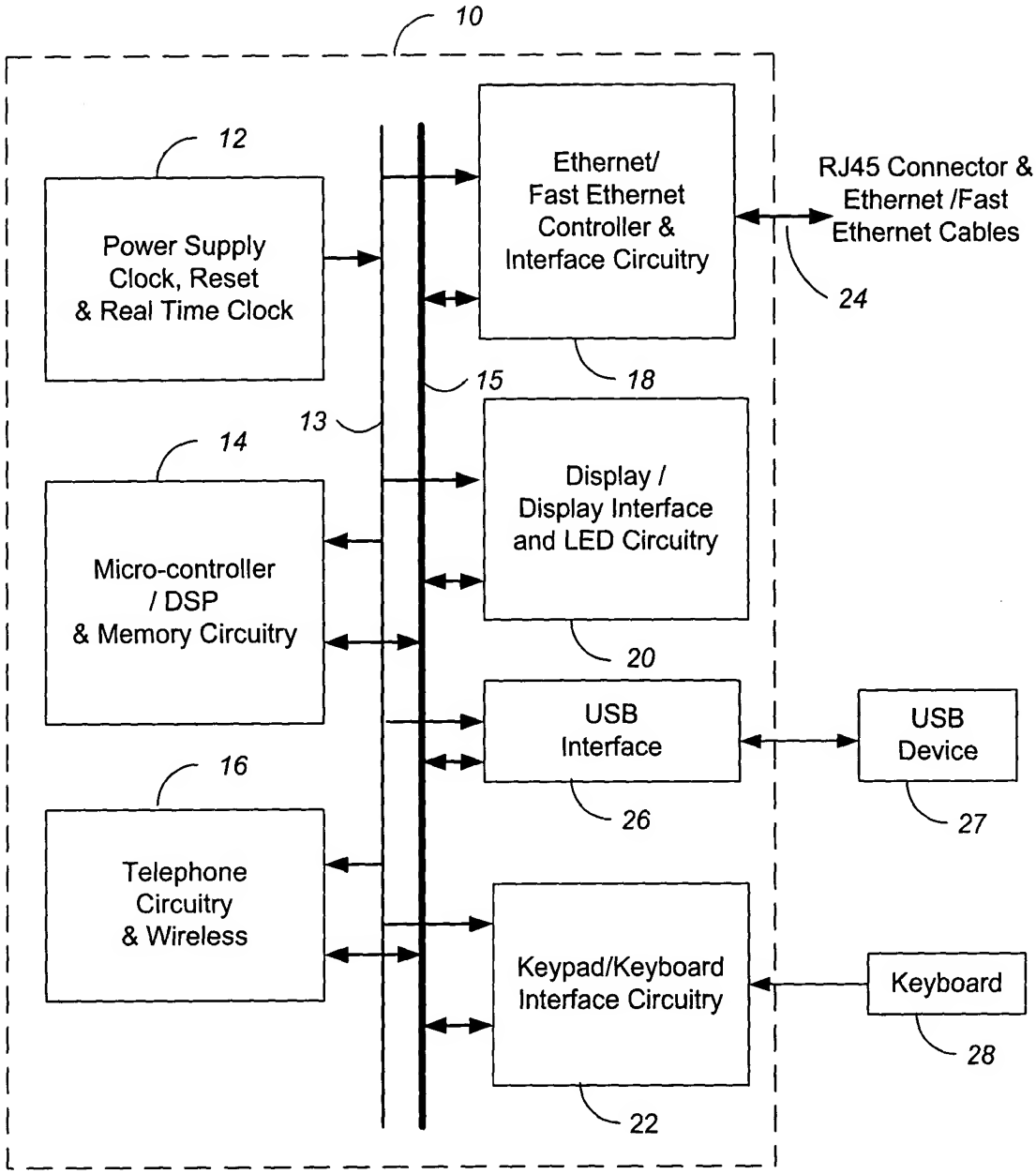

10
12
Power Supply
Clock, Reset
& Real Time Clock
Ethernet/
Fast Ethernet
Controller &
Interface Circuitry
RJ45 Connector &
Ethernet /Fast
Ethernet Cables
24
18
15
13
14
Micro-controller
/ DSP
& Memory Circuitry
Display /
Display Interface
and LED Circuitry
20
USB
Interface
USB
Device
26
27
16
Telephone
Circuitry
& Wireless
Keypad/Keyboard
Interface Circuitry
Keyboard
28
22

FIG. 1

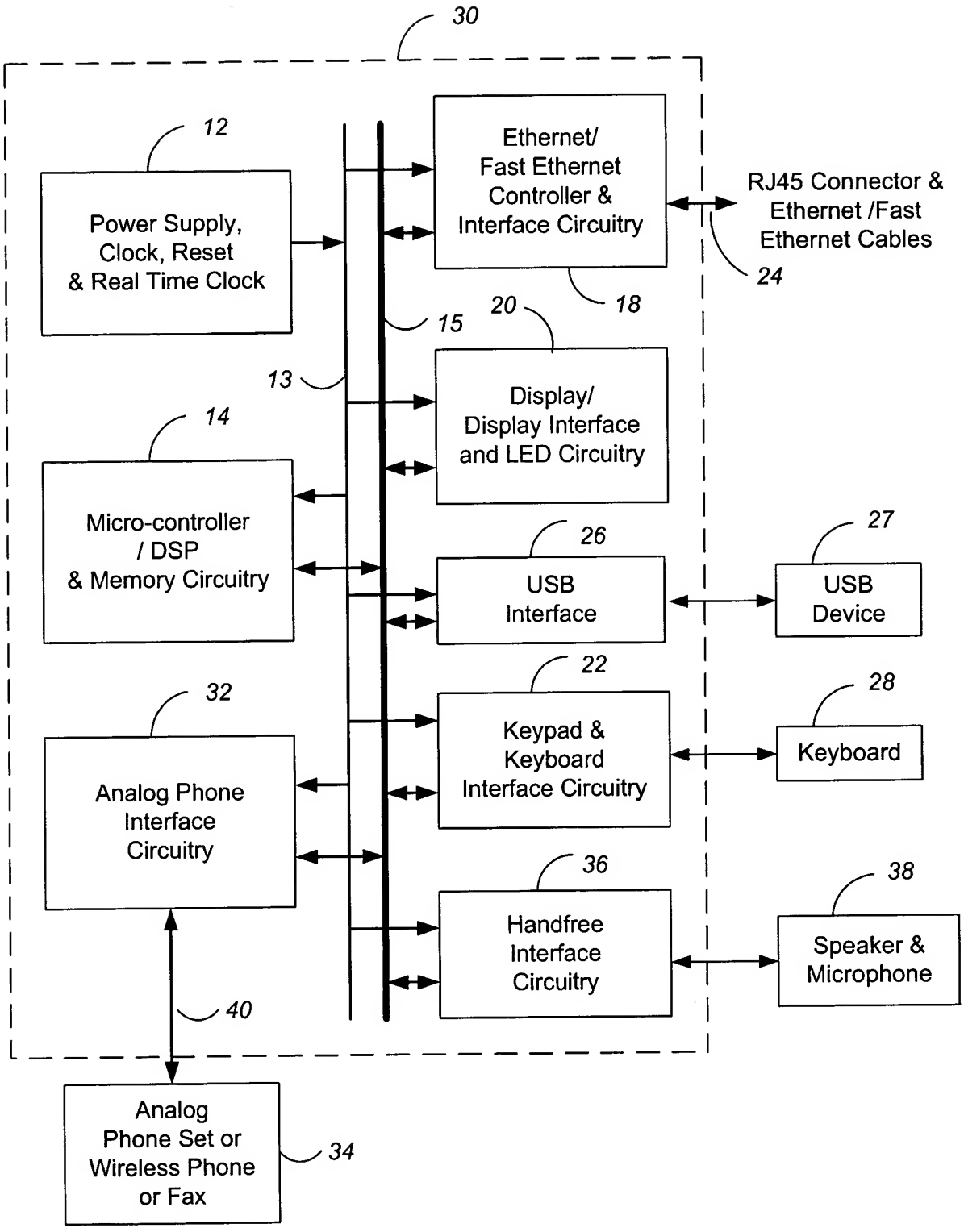

30
12
Power Supply,
Clock, Reset
& Real Time Clock
Ethernet/
Fast Ethernet
Controller &
Interface Circuitry
RJ45 Connector &
Ethernet /Fast
Ethernet Cables
24
18
20
15
13
Display/
Display Interface
and LED Circuitry
14
Micro-controller
/ DSP
& Memory Circuitry
26
USB
Interface
27
USB
Device
22
32
Keypad &
Keyboard
Interface Circuitry
28
Keyboard
Analog Phone
Interface
Circuitry
36
38
Handfree
Interface
Circuitry
Speaker &
Microphone
40
Analog
Phone Set or
Wireless Phone
or Fax
34

FIG. 2

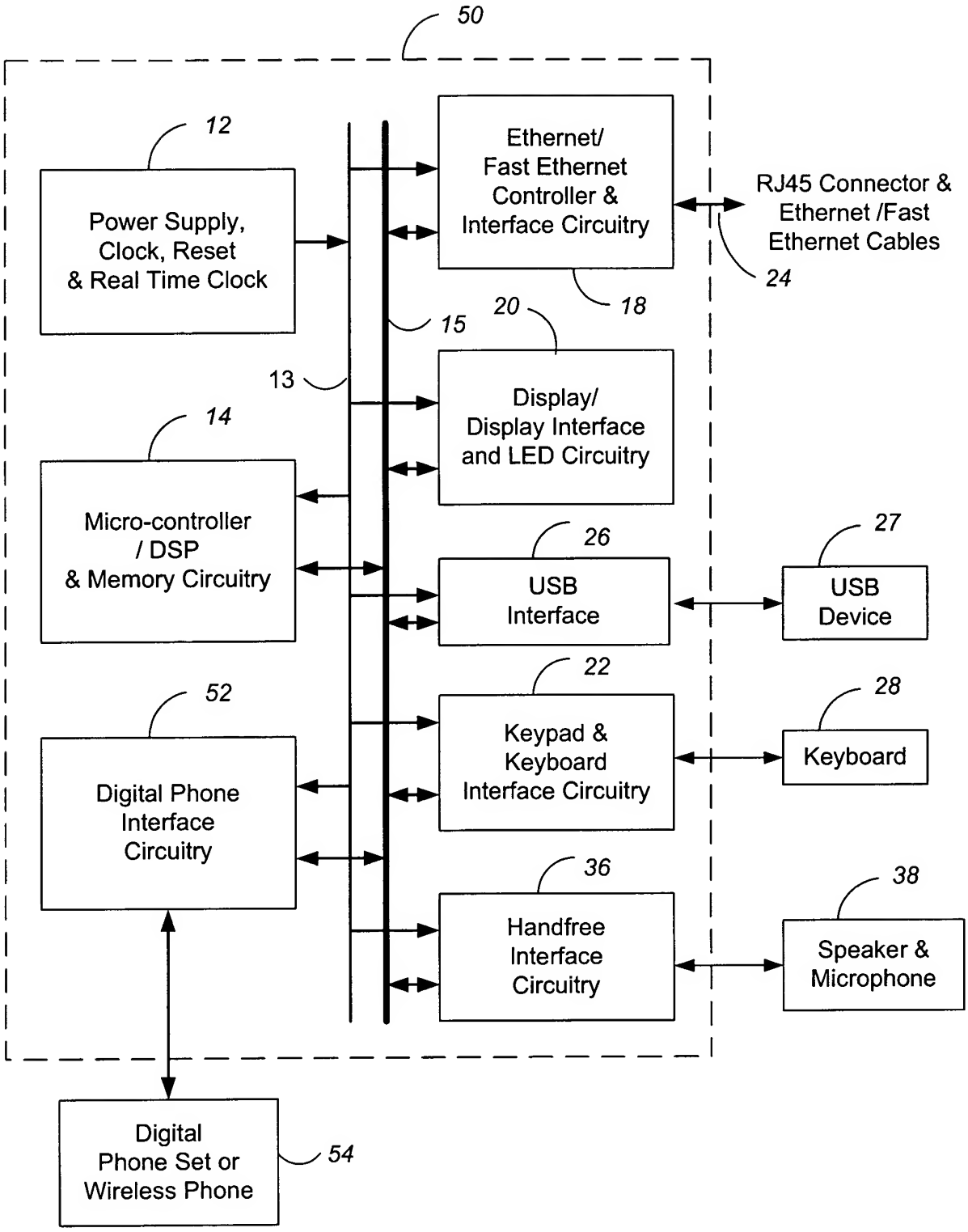

50
12
Power Supply,
Clock, Reset
& Real Time Clock
Ethernet/
Fast Ethernet
Controller &
Interface Circuitry
RJ45 Connector &
Ethernet /Fast
Ethernet Cables
24
18
20
15
13
Display/
Display Interface
and LED Circuitry
14
Micro-controller
/ DSP
& Memory Circuitry
26
USB
Interface
27
USB
Device
22
52
Keypad &
Keyboard
Interface Circuitry
28
Keyboard
Digital Phone
Interface
Circuitry
36
38
Handfree
Interface
Circuitry
Speaker &
Microphone
Digital
Phone Set or
Wireless Phone
54

FIG. 3

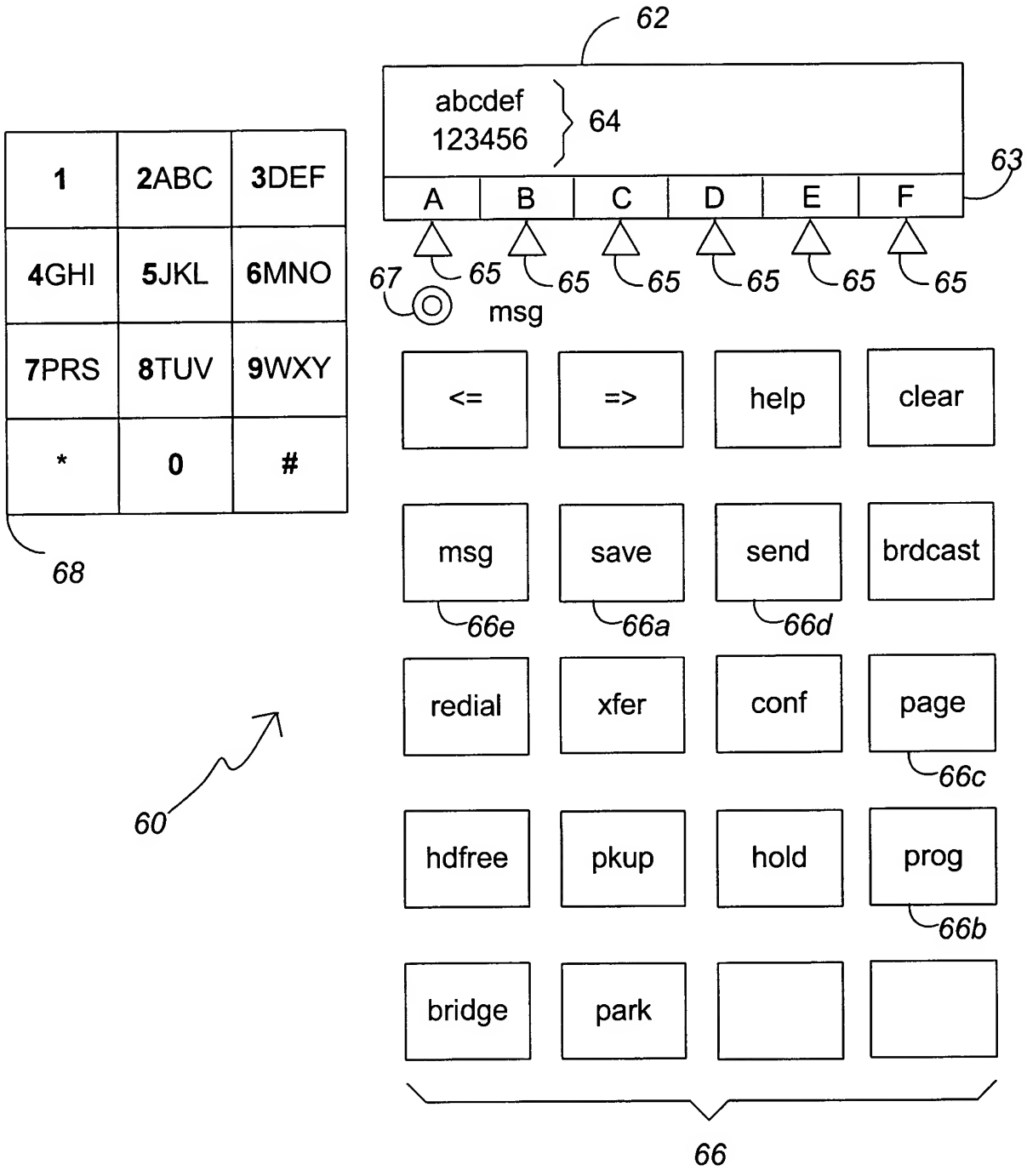

62
abcdef
123456
64
63
A
B
C
D
E
F
67
65
65
65
65
65
65
msg
1
2ABC
3DEF
4GHI
5JKL
6MNO
7PRS
8TUV
9WXY
*
0
#
68
<=
=>
help
clear
msg
save
send
brdcast
66e
66a
66d
redial
xfer
conf
page
66c
60
hdfree
pkup
hold
prog
66b
bridge
park
66

FIG. 4A

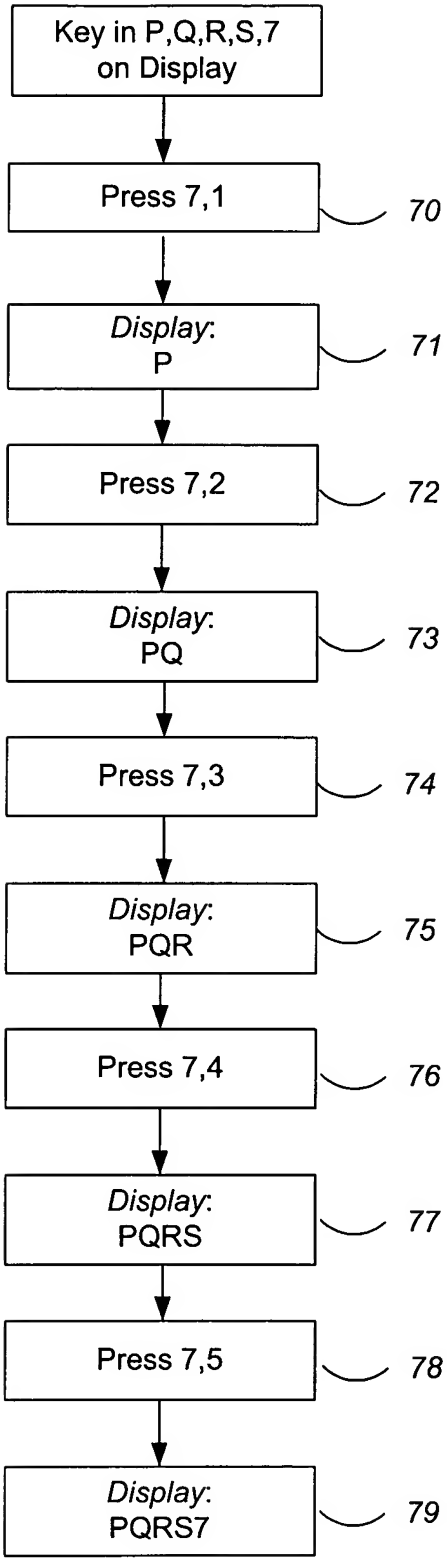

Key in P,Q,R,S,7 on Display
Press 7,1
70
Display: P
71
Press 7,2
72
Display: PQ
73
Press 7,3
74
Display: PQR
75
Press 7,4
76
Display: PQRS
77
Press 7,5
78
Display: PQRS7
79

FIG. 4B

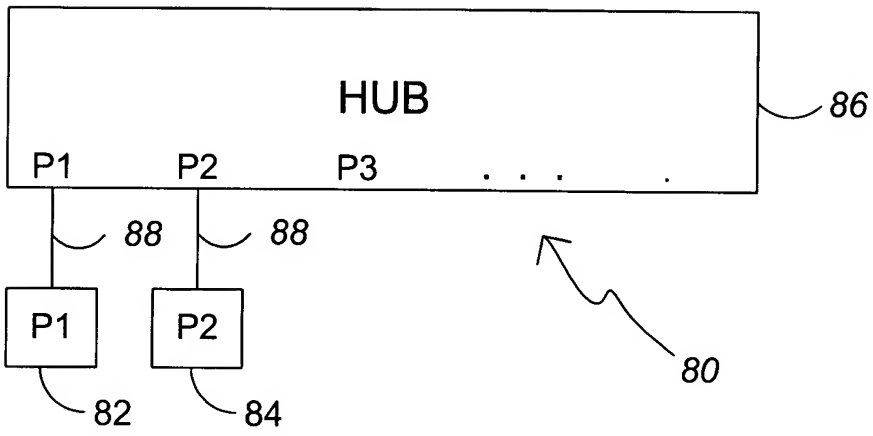

HUB
86
P1
P2
P3
88
88
P1
P2
80
82
84

FIG. 5

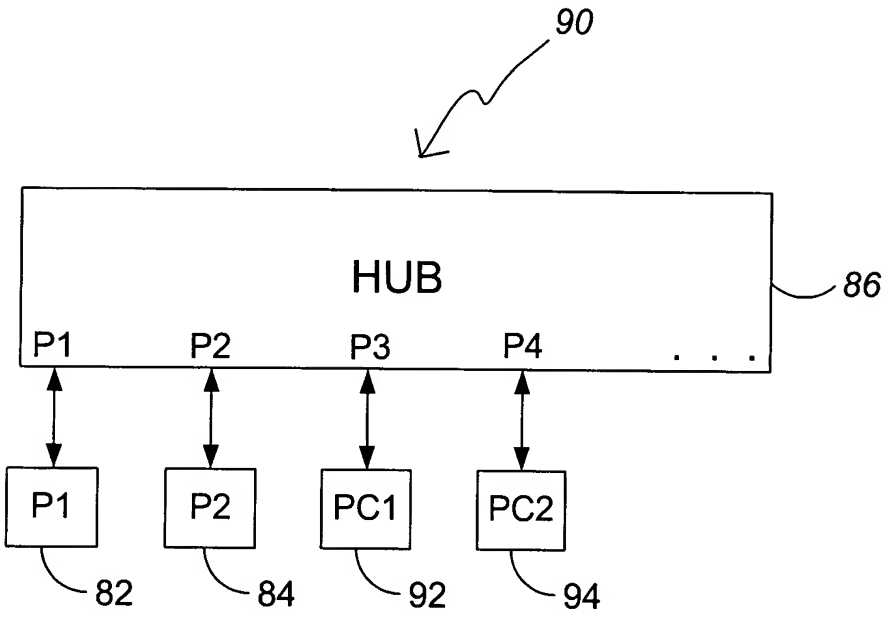

90
HUB
86
P1
P2
P3
P4
P1
P2
PC1
PC2
82
84
92
94

FIG. 6

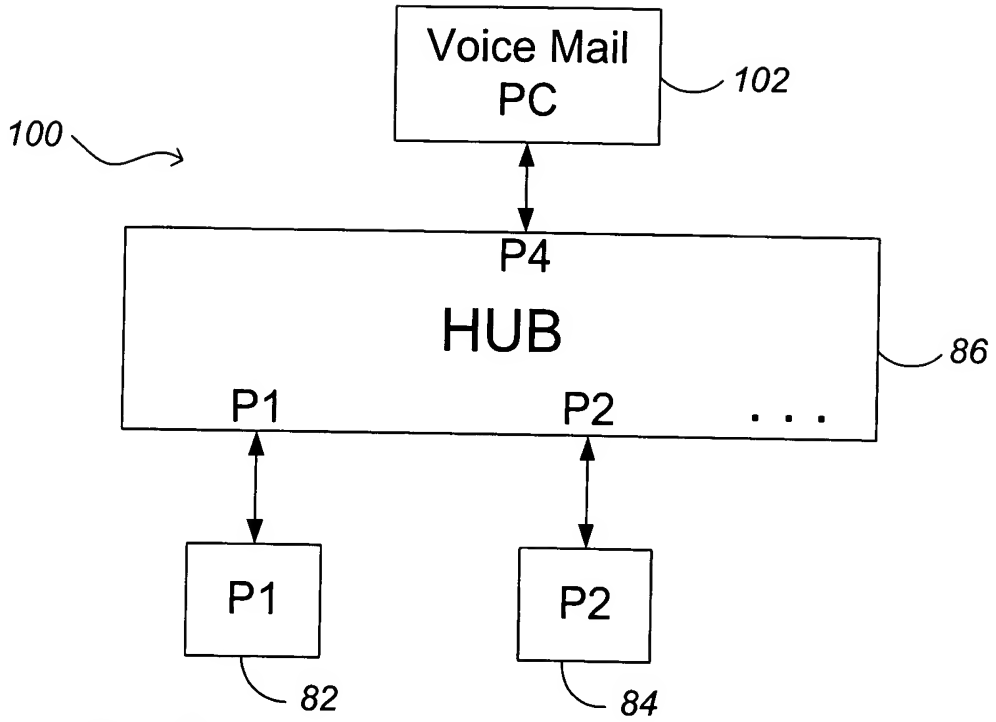

Voice Mail
PC
102
100
P4
HUB
86
P1
P2
. . .
P1
P2
82
84

FIG. 7A

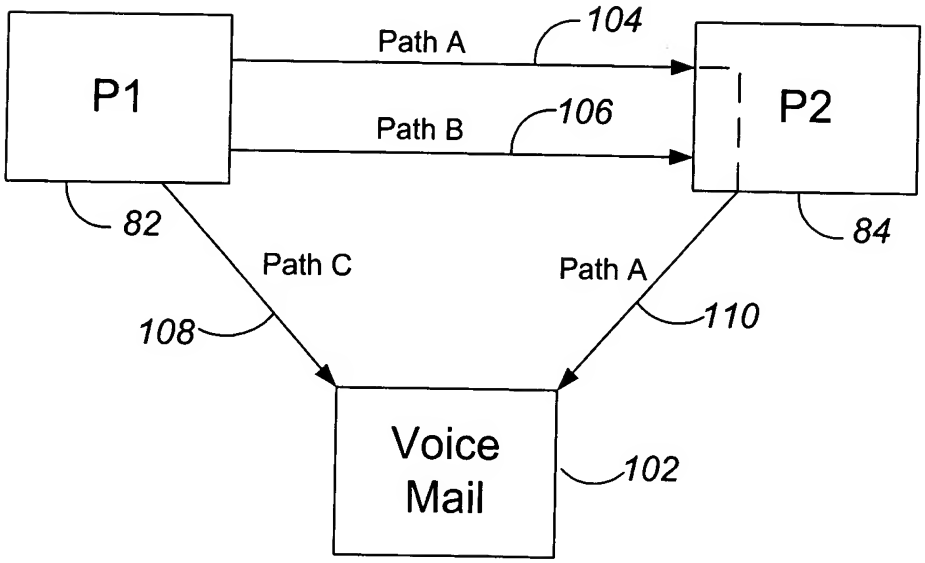

P1
Path A
104
Path B
106
P2
82
84
Path C
Path A
108
110
Voice
Mail
102

FIG. 7B

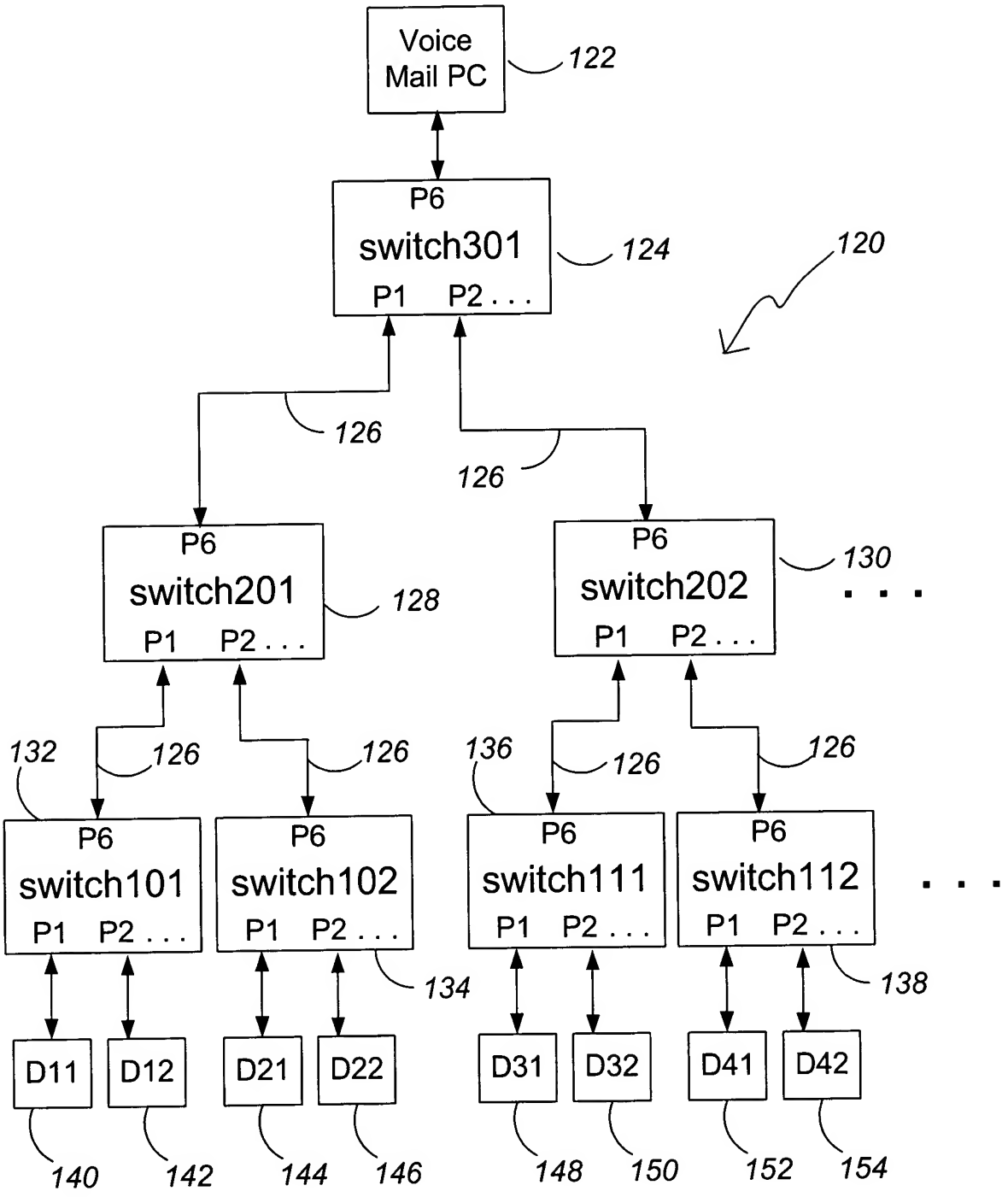

Voice Mail PC
122
P6
switch301
P1 P2 . . .
124
120
126
126
P6
switch201
P1 P2 . . .
128
P6
switch202
P1 P2 . . .
130
132
126
126
136
126
126
P6
switch101
P1 P2 . . .
P6
switch102
P1 P2 . . .
P6
switch111
P1 P2 . . .
P6
switch112
P1 P2 . . .
134
138
D11
D12
D21
D22
D31
D32
D41
D42
140
142
144
146
148
150
152
154

FIG. 8

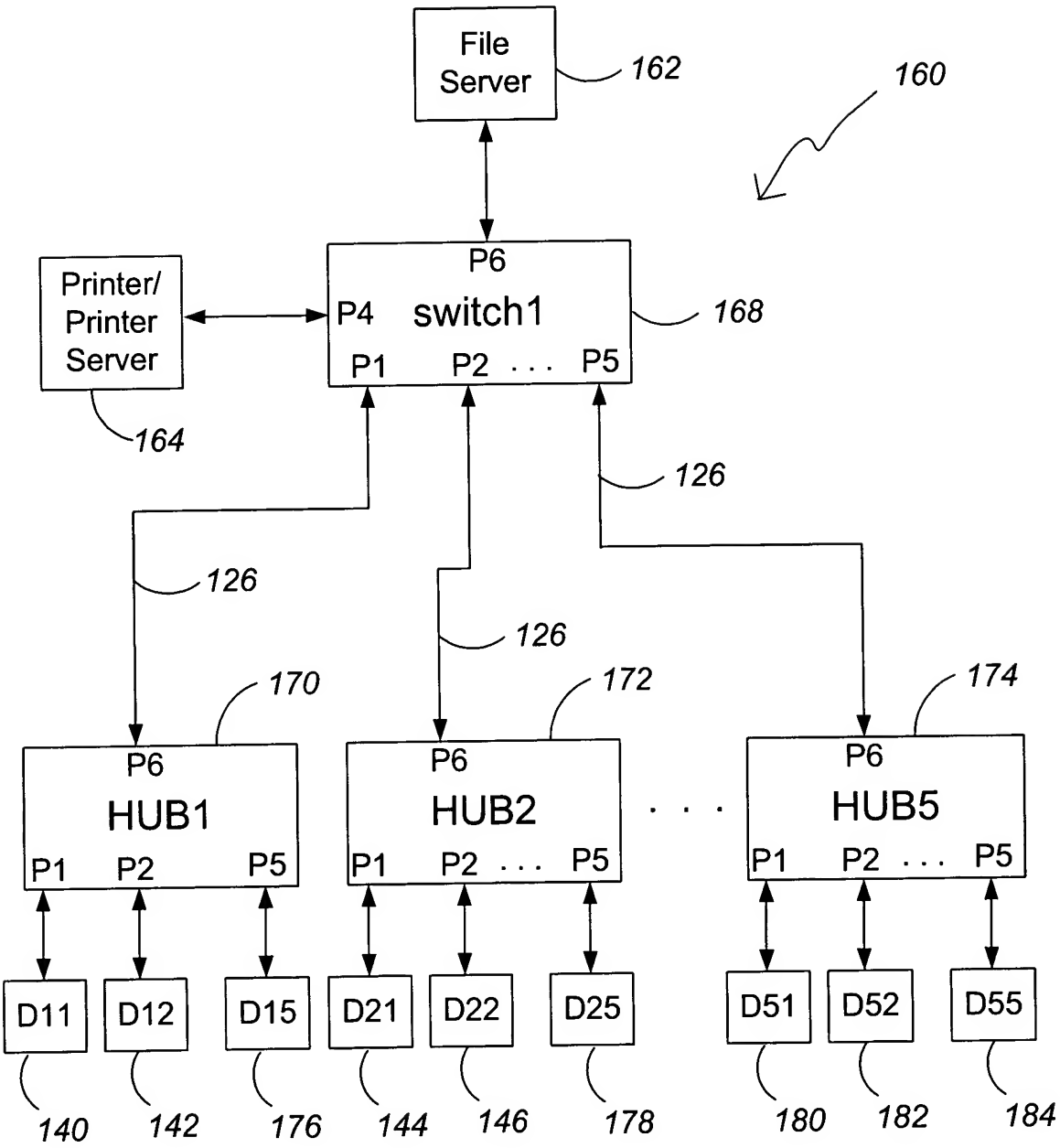

File Server
162
160
P6
Printer/ Printer Server
P4 switch1
168
P1 P2 . . . P5
164
126
126
126
170
172
174
P6
HUB1
P1 P2 P5
P6
HUB2
P1 P2 . . . P5
P6
HUB5
P1 P2 . . . P5
D11
D12
D15
D21
D22
D25
D51
D52
D55
140
142
176
144
146
178
180
182
184

FIG. 9

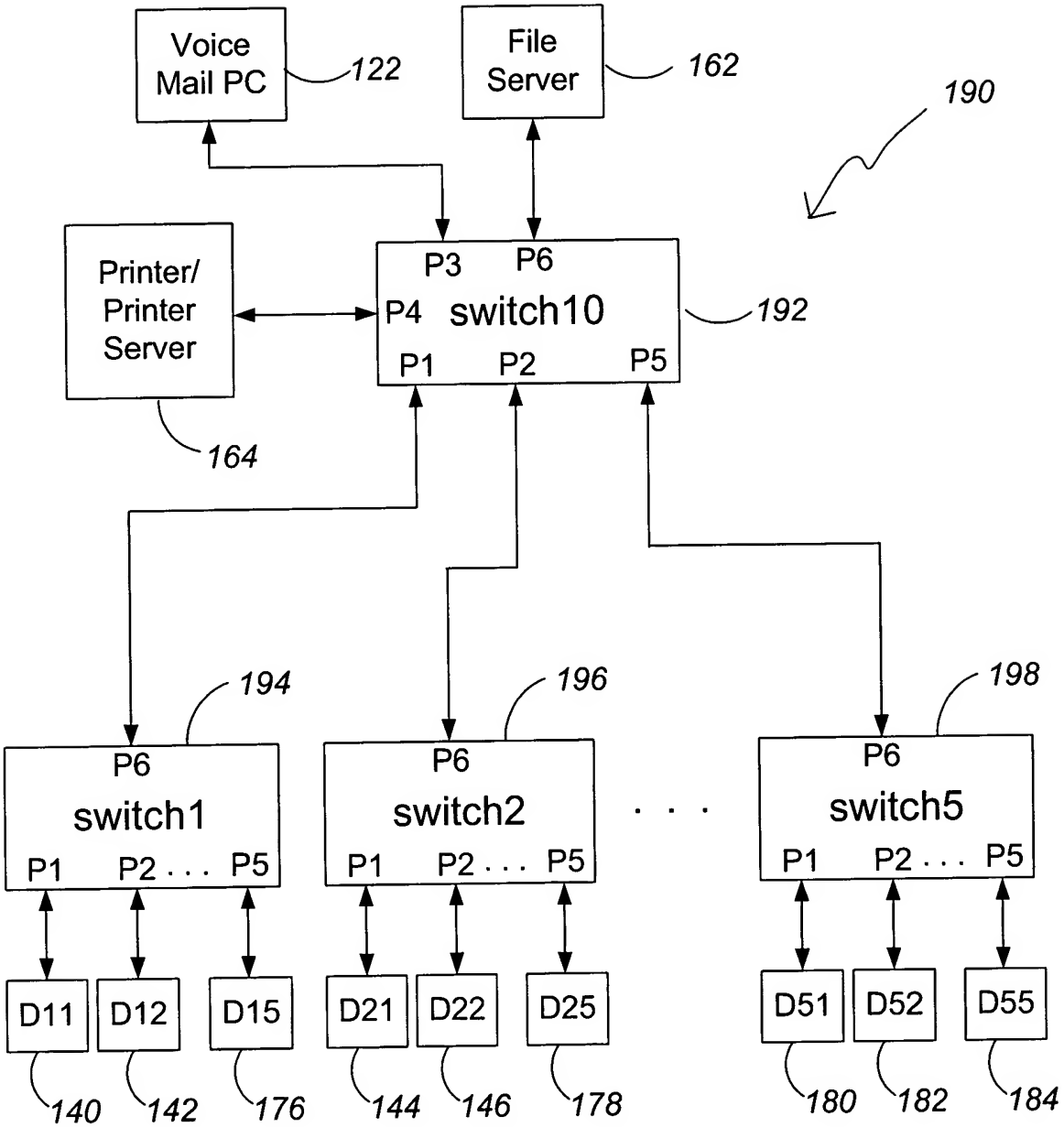

Voice Mail PC
122
File Server
162
190
Printer/ Printer Server
164
P3
P6
P4
switch10
192
P1
P2
P5
194
196
198
P6
switch1
P1
P2 . . . P5
P6
switch2
P1
P2 . . . P5
. . .
P6
switch5
P1
P2 . . . P5
D11
D12
D15
D21
D22
D25
D51
D52
D55
140
142
176
144
146
178
180
182
184

FIG. 10

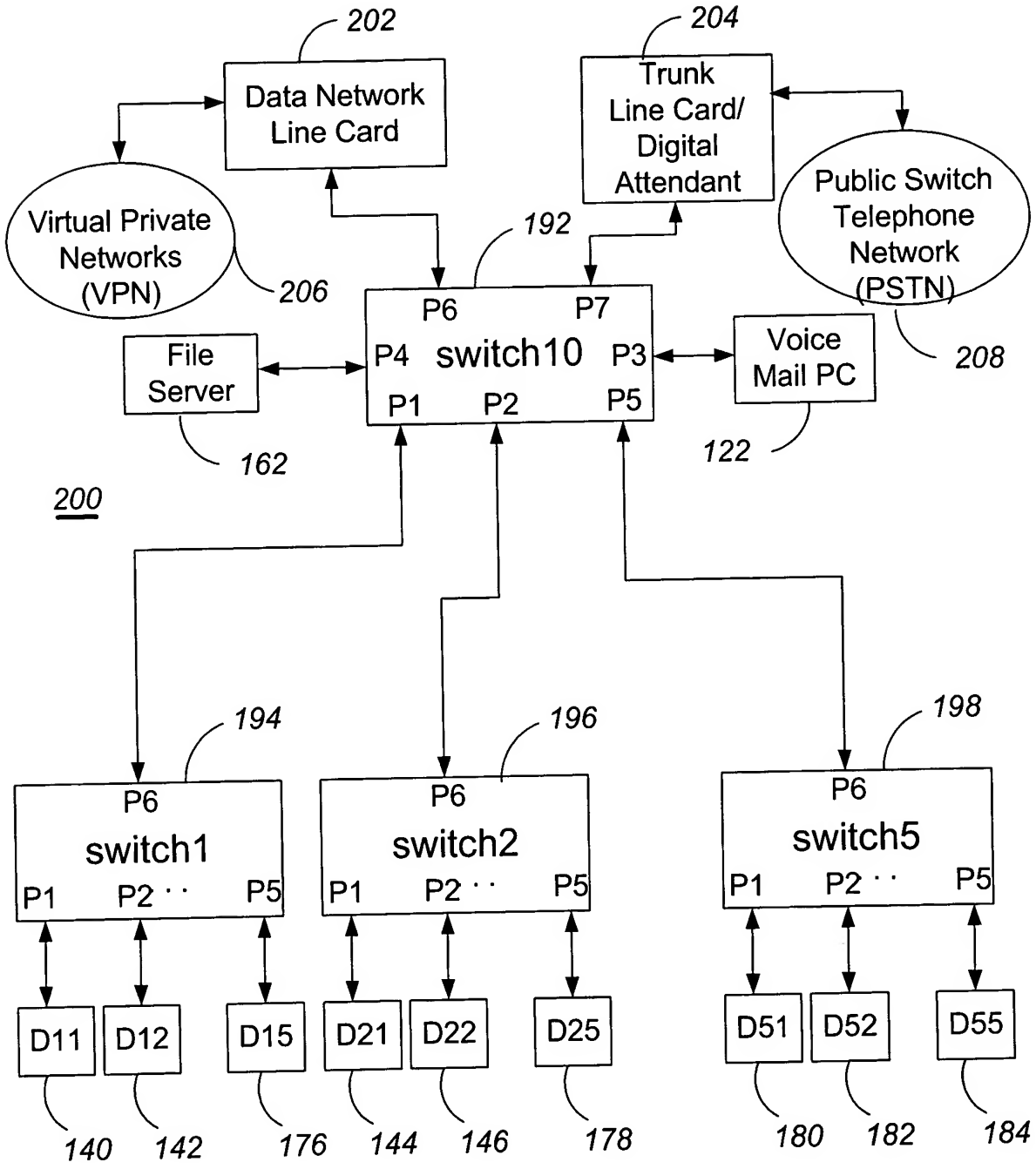

202
Data Network Line Card
204
Trunk Line Card/ Digital Attendant
Virtual Private Networks (VPN)
206
192
Public Switch Telephone Network (PSTN)
208
P6
P7
P4
switch10
P3
P1
P2
P5
File Server
162
Voice Mail PC
122
200
194
196
198
P6
switch1
P1
P2
P5
P6
switch2
P1
P2
P5
P6
switch5
P1
P2
P5
D11
D12
D15
D21
D22
D25
D51
D52
D55
140
142
176
144
146
178
180
182
184

FIG. 11

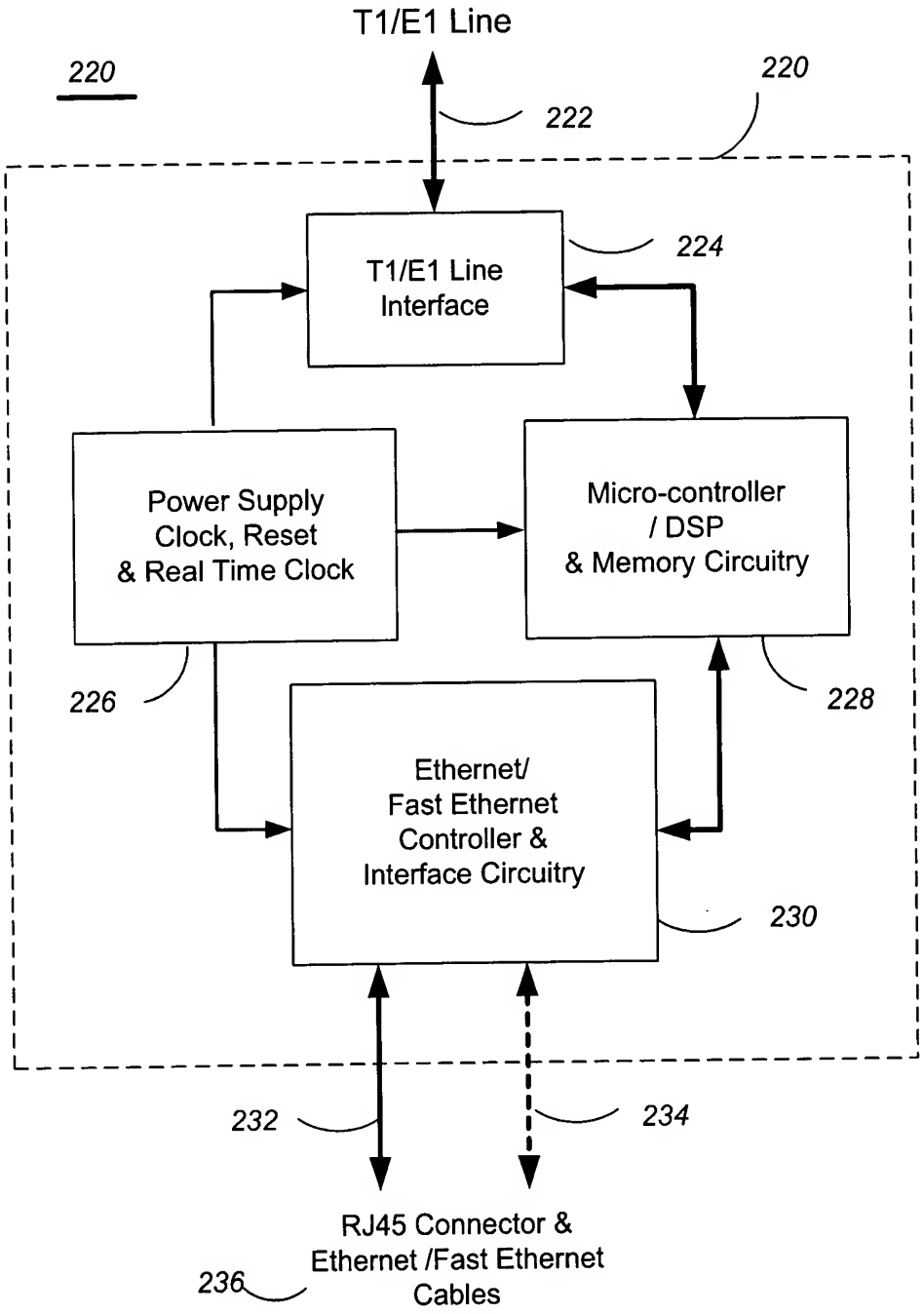

T1/E1 Line
220
222
220
224
T1/E1 Line Interface
Power Supply Clock, Reset & Real Time Clock
Micro-controller / DSP & Memory Circuitry
226
228
Ethernet/ Fast Ethernet Controller & Interface Circuitry
230
232
234
RJ45 Connector & Ethernet /Fast Ethernet Cables
236

FIG. 12A

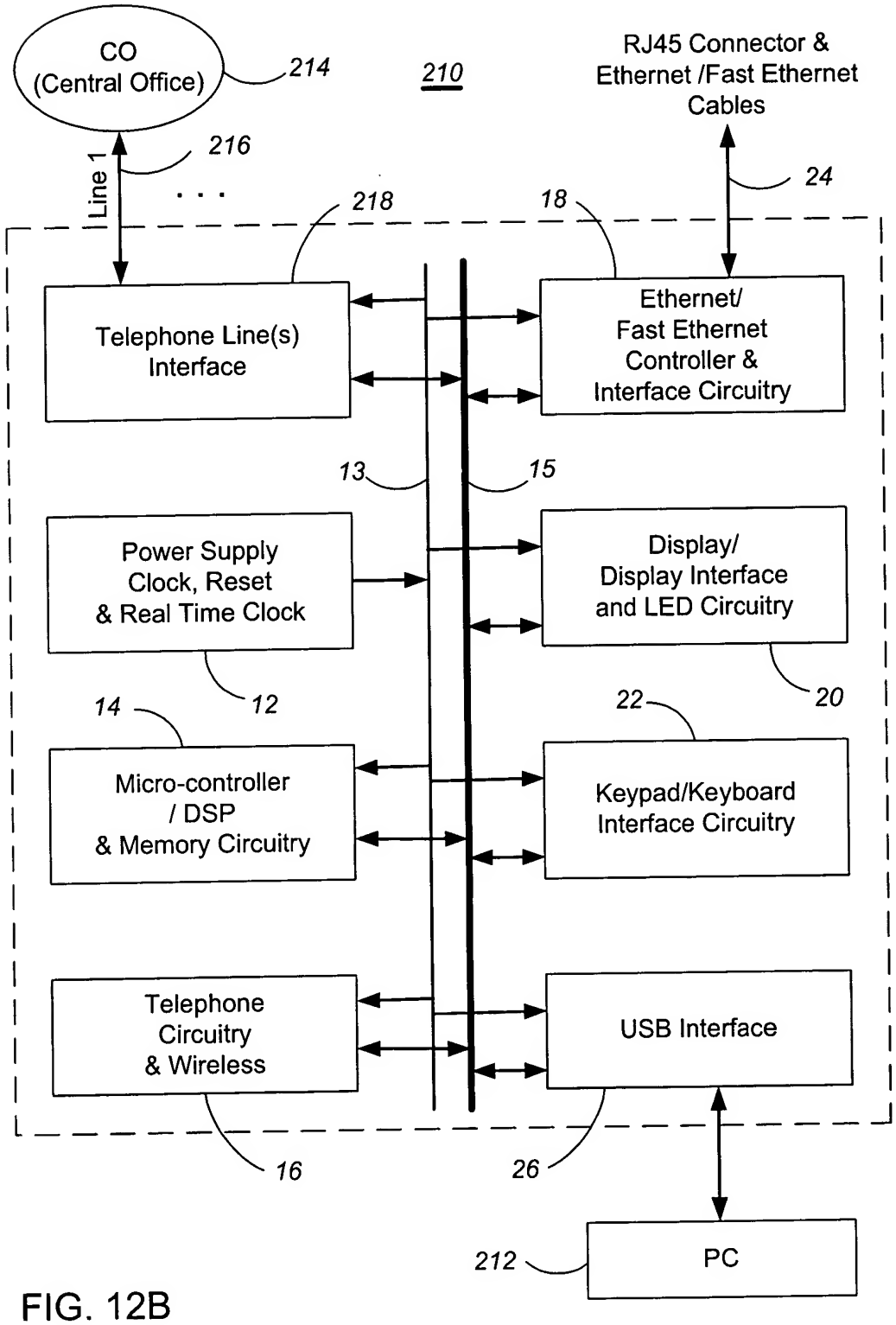

CO
(Central Office)
214
210
RJ45 Connector &
Ethernet /Fast Ethernet
Cables
216
Line 1
24
218
18
Telephone Line(s)
Interface
Ethernet/
Fast Ethernet
Controller &
Interface Circuitry
13
15
Power Supply
Clock, Reset
& Real Time Clock
Display/
Display Interface
and LED Circuitry
12
20
14
22
Micro-controller
/ DSP
& Memory Circuitry
Keypad/Keyboard
Interface Circuitry
Telephone
Circuitry
& Wireless
USB Interface
16
26
212
PC

FIG. 12B

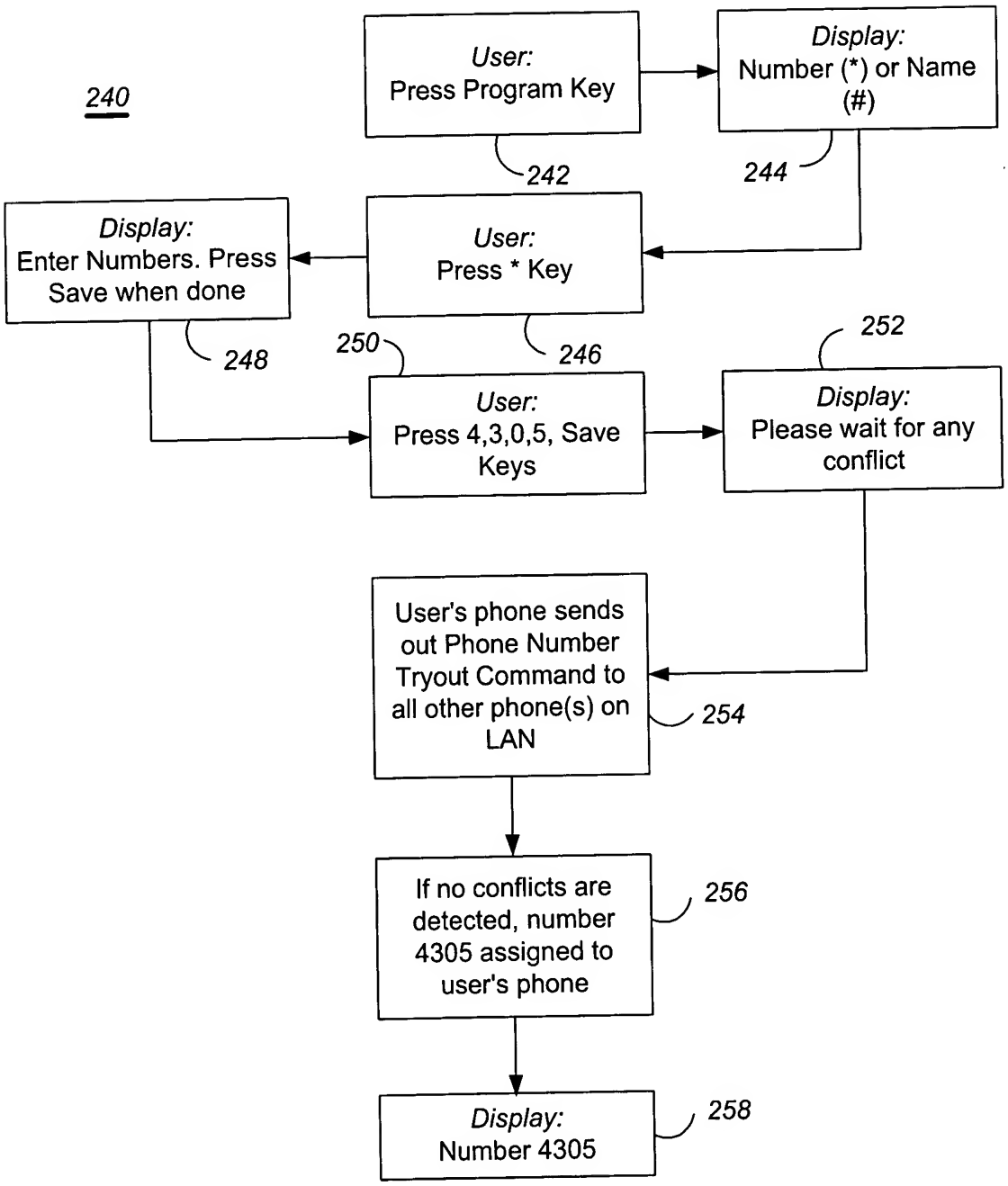

240
User:
Press Program Key
Display:
Number (*) or Name (#)
242
244
Display:
Enter Numbers. Press Save when done
User:
Press * Key
248
250
246
252
User:
Press 4,3,0,5, Save Keys
Display:
Please wait for any conflict
User's phone sends out Phone Number Tryout Command to all other phone(s) on LAN
254
If no conflicts are detected, number 4305 assigned to user's phone
256
Display:
Number 4305
258

FIG. 13

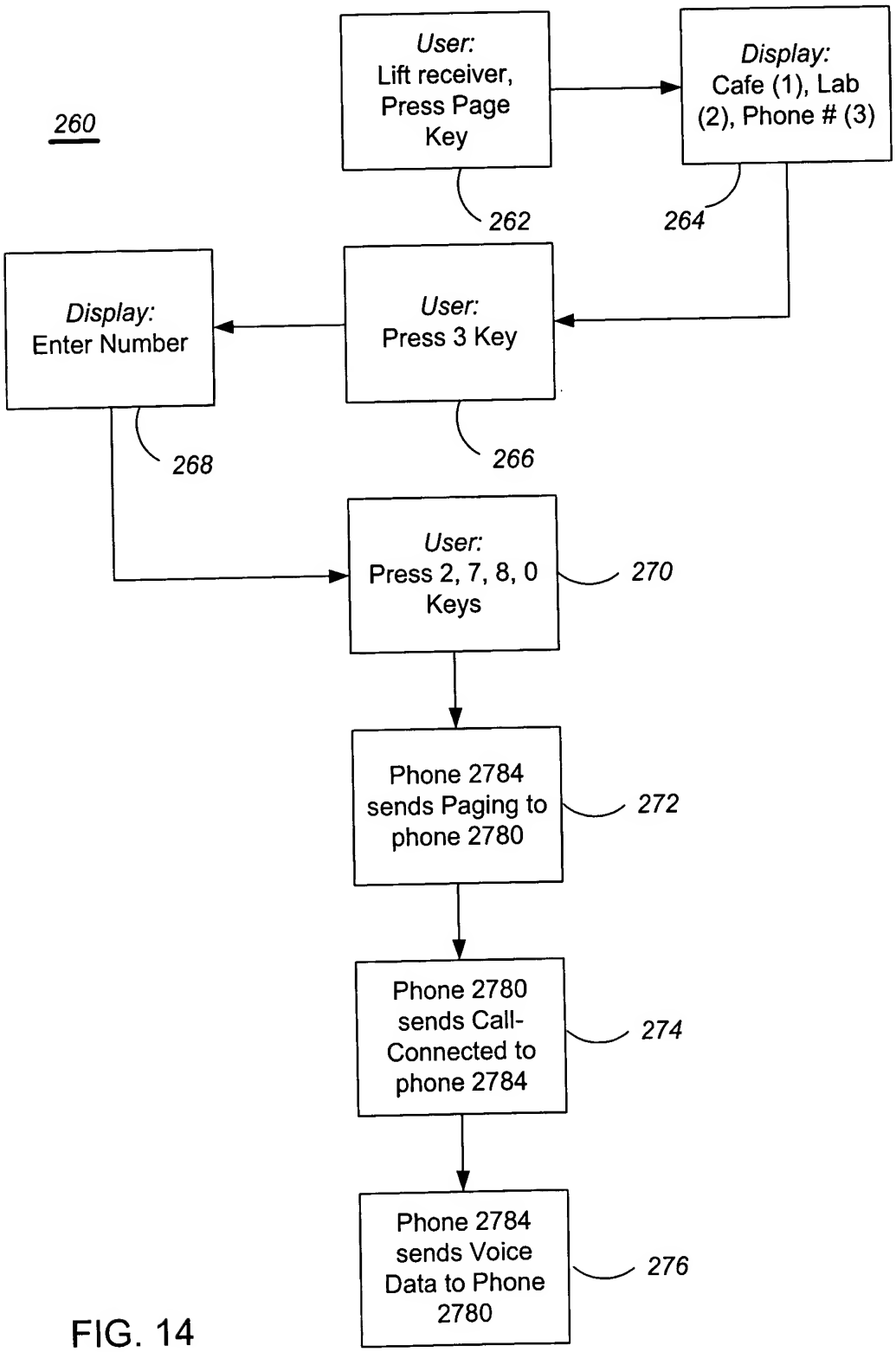

260
User: Lift receiver, Press Page Key
Display: Cafe (1), Lab (2), Phone # (3)
262
264
Display: Enter Number
User: Press 3 Key
268
266
User: Press 2, 7, 8, 0 Keys
270
Phone 2784 sends Paging to phone 2780
272
Phone 2780 sends Call-Connected to phone 2784
274
Phone 2784 sends Voice Data to Phone 2780
276

FIG. 14

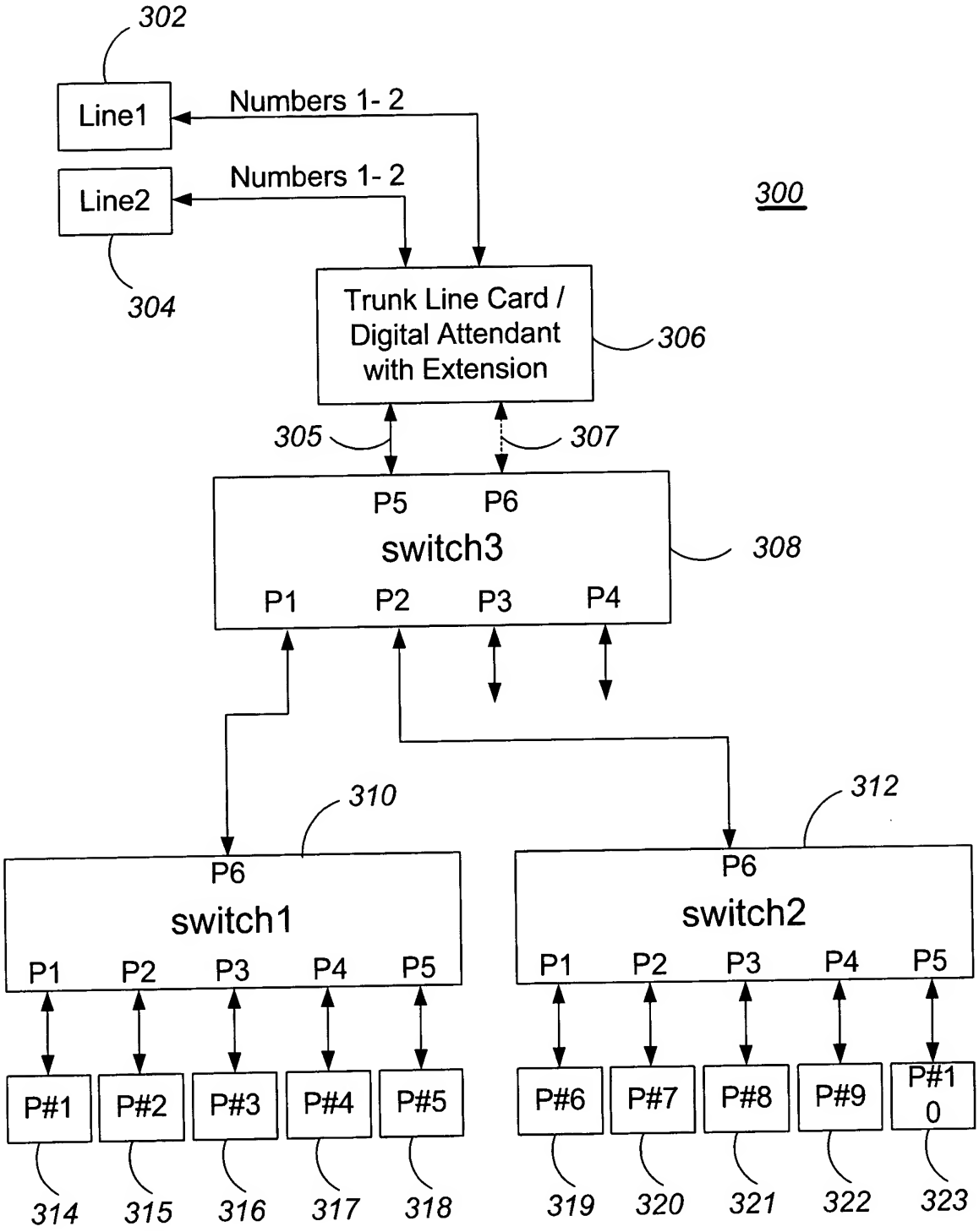

302
Line1
Numbers 1- 2
Line2
Numbers 1- 2
300
304
Trunk Line Card / Digital Attendant with Extension
306
305
307
P5
P6
switch3
308
P1
P2
P3
P4
310
312
P6
switch1
P6
switch2
P1
P2
P3
P4
P5
P1
P2
P3
P4
P5
P#1
P#2
P#3
P#4
P#5
P#6
P#7
P#8
P#9
P#10
314
315
316
317
318
319
320
321
322
323

FIG. 15

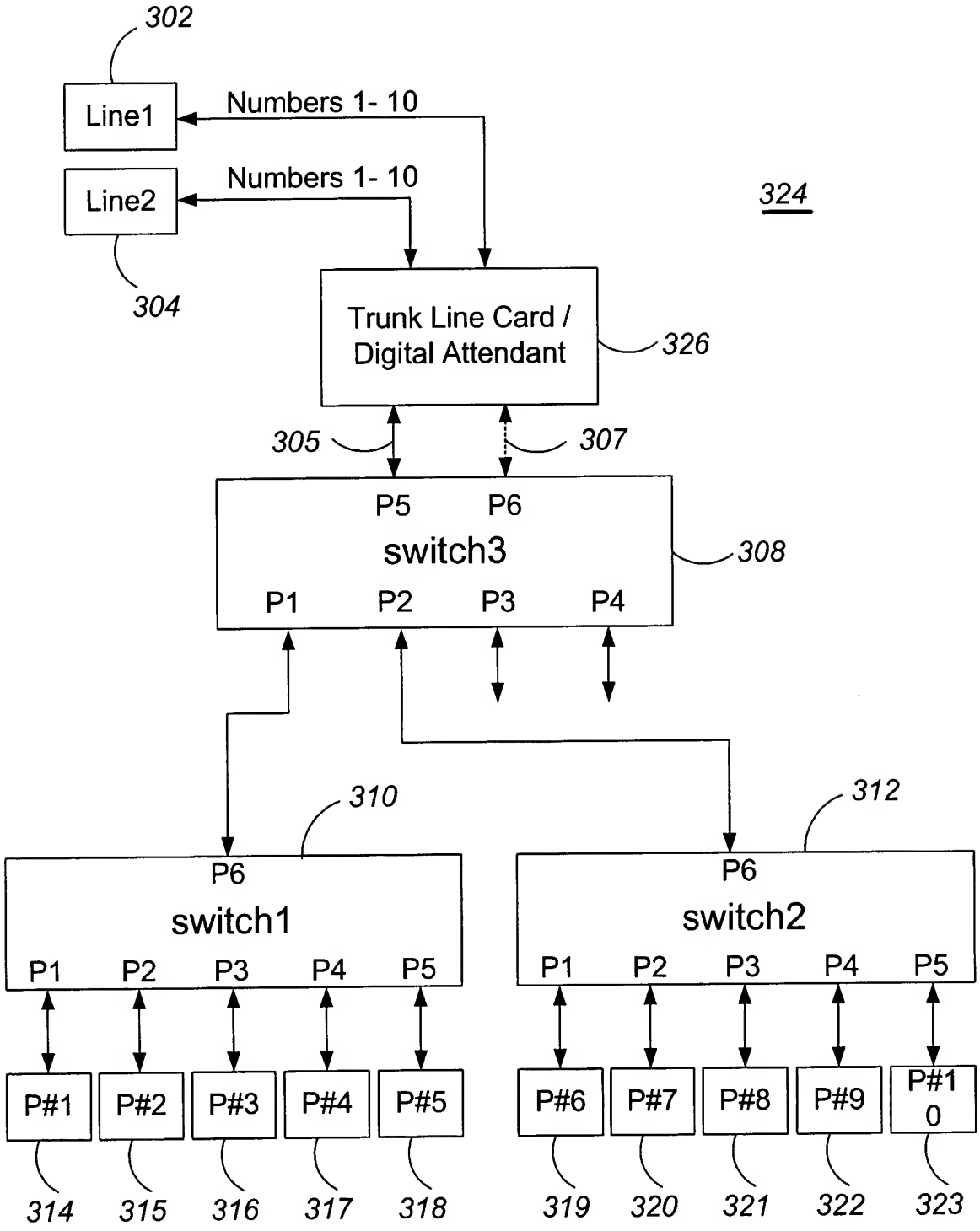

302
Line1
Numbers 1- 10
Line2
Numbers 1- 10
304
324
Trunk Line Card /
Digital Attendant
326
305
307
P5
P6
switch3
308
P1
P2
P3
P4
310
312
P6
switch1
P1
P2
P3
P4
P5
P6
switch2
P1
P2
P3
P4
P5
P#1
P#2
P#3
P#4
P#5
P#6
P#7
P#8
P#9
P#1
0
314
315
316
317
318
319
320
321
322
323

FIG. 16

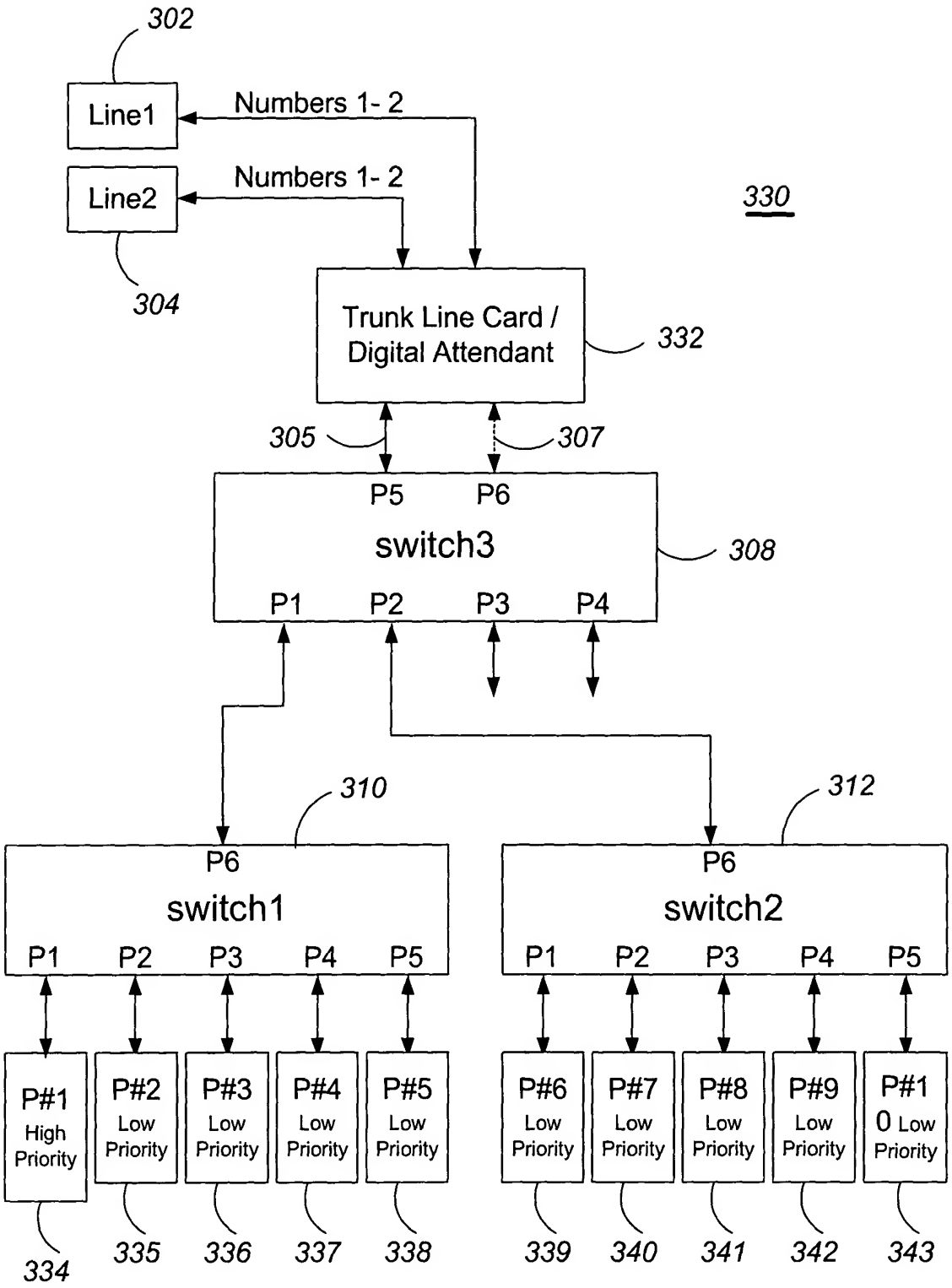
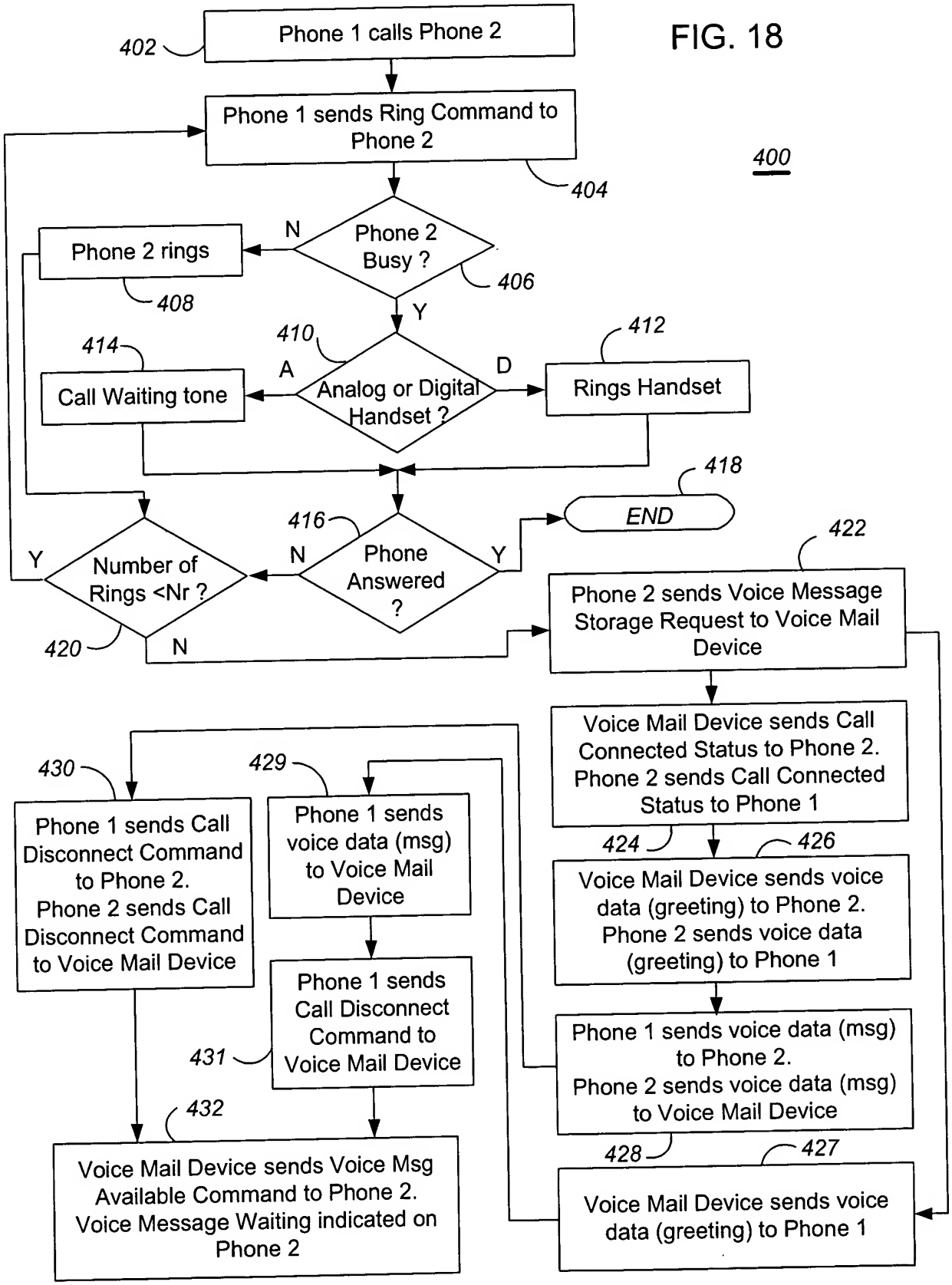

302
Line1
Numbers 1- 2
Line2
Numbers 1- 2
330
304
Trunk Line Card /
Digital Attendant
332
305
307
P5
P6
switch3
308
P1
P2
P3
P4
310
312
P6
switch1
P6
switch2
P1
P2
P3
P4
P5
P1
P2
P3
P4
P5
P#1
High
Priority
P#2
Low
Priority
P#3
Low
Priority
P#4
Low
Priority
P#5
Low
Priority
P#6
Low
Priority
P#7
Low
Priority
P#8
Low
Priority
P#9
Low
Priority
P#1
0 Low
Priority
334
335
336
337
338
339
340
341
342
343

FIG. 17

FIG. 18


400
402
Phone 1 calls Phone 2
Phone 1 sends Ring Command to Phone 2
404
Phone 2 Busy ?
406
N
Y
Phone 2 rings
408
410
Analog or Digital Handset ?
A
D
412
Rings Handset
414
Call Waiting tone
418
END
416
Phone Answered ?
Y
N
Number of Rings <Nr ?
Y
N
420
422
Phone 2 sends Voice Message Storage Request to Voice Mail Device
Voice Mail Device sends Call Connected Status to Phone 2. Phone 2 sends Call Connected Status to Phone 1
424
426
Voice Mail Device sends voice data (greeting) to Phone 2. Phone 2 sends voice data (greeting) to Phone 1
Phone 1 sends voice data (msg) to Phone 2. Phone 2 sends voice data (msg) to Voice Mail Device
428
427
Voice Mail Device sends voice data (greeting) to Phone 1
429
Phone 1 sends voice data (msg) to Voice Mail Device
430
Phone 1 sends Call Disconnect Command to Phone 2. Phone 2 sends Call Disconnect Command to Voice Mail Device
431
Phone 1 sends Call Disconnect Command to Voice Mail Device
432
Voice Mail Device sends Voice Msg Available Command to Phone 2. Voice Message Waiting indicated on Phone 2

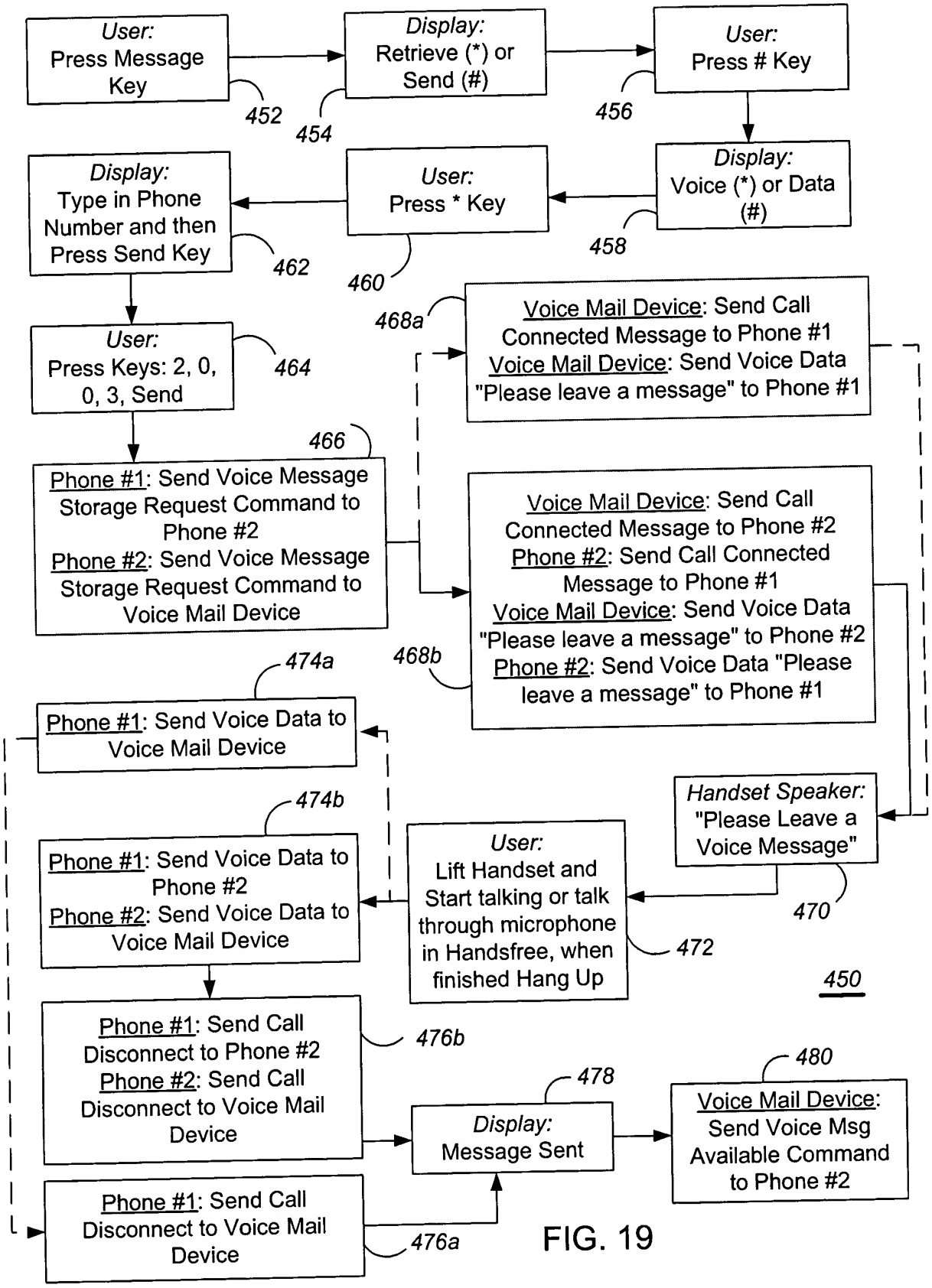

User: Press Message Key
452
Display: Retrieve (*) or Send (#)
454
User: Press # Key
456
Display: Voice (*) or Data (#)
458
User: Press * Key
460
Display: Type in Phone Number and then Press Send Key
462
User: Press Keys: 2, 0, 0, 3, Send
464
466
Phone #1: Send Voice Message Storage Request Command to Phone #2
Phone #2: Send Voice Message Storage Request Command to Voice Mail Device
468a
Voice Mail Device: Send Call Connected Message to Phone #1
Voice Mail Device: Send Voice Data "Please leave a message" to Phone #1
Voice Mail Device: Send Call Connected Message to Phone #2
Phone #2: Send Call Connected Message to Phone #1
Voice Mail Device: Send Voice Data "Please leave a message" to Phone #2
468b
Phone #2: Send Voice Data "Please leave a message" to Phone #1
Handset Speaker: "Please Leave a Voice Message"
470
User: Lift Handset and Start talking or talk through microphone in Handsfree, when finished Hang Up
472
474a
Phone #1: Send Voice Data to Voice Mail Device
474b
Phone #1: Send Voice Data to Phone #2
Phone #2: Send Voice Data to Voice Mail Device
Phone #1: Send Call Disconnect to Phone #2
Phone #2: Send Call Disconnect to Voice Mail Device
476b
Phone #1: Send Call Disconnect to Voice Mail Device
476a
478
Display: Message Sent
480
Voice Mail Device: Send Voice Msg Available Command to Phone #2
450

FIG. 19

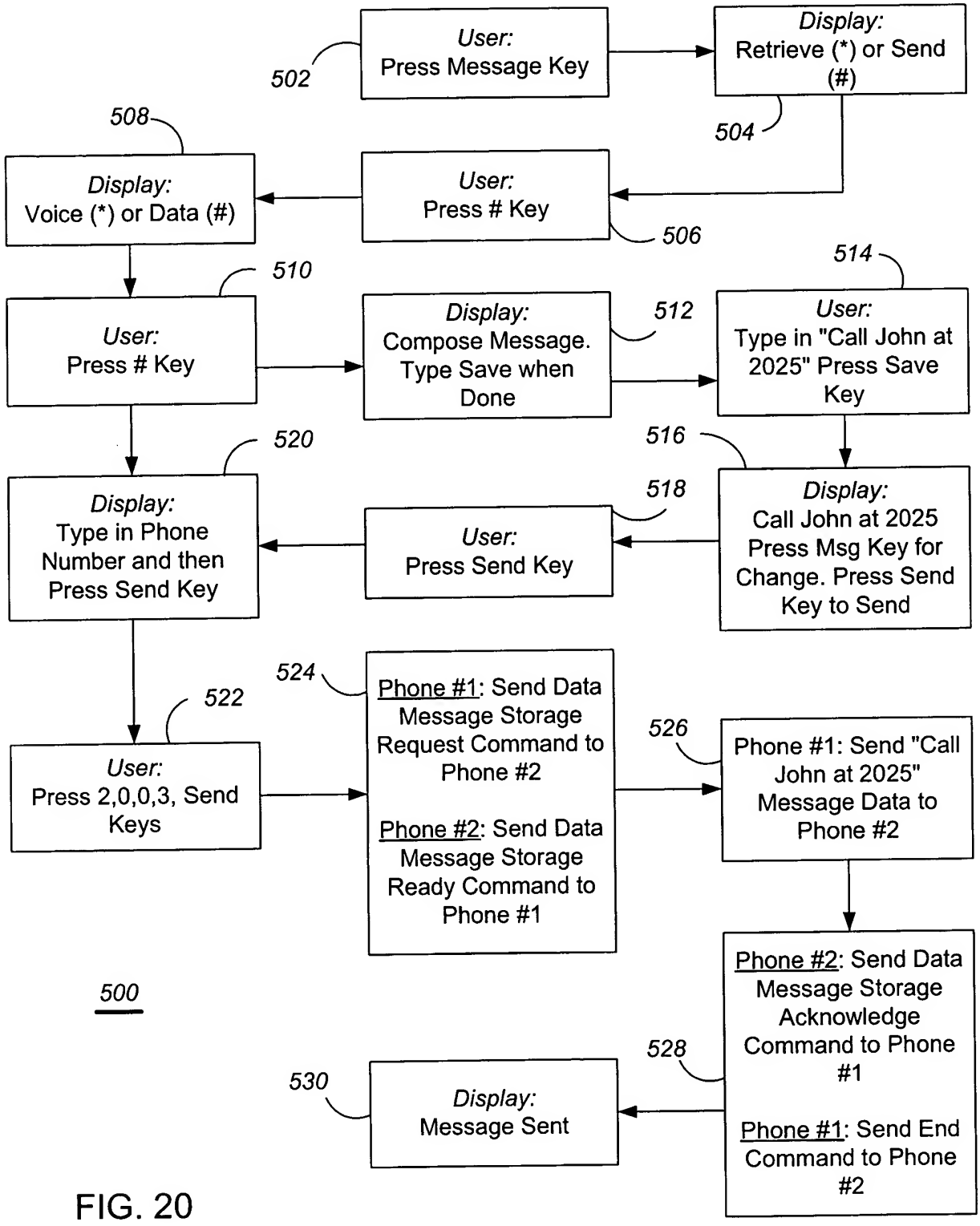

User: Press Message Key
502
Display: Retrieve (*) or Send (#)
504
User: Press # Key
506
Display: Voice (*) or Data (#)
508
User: Press # Key
510
Display: Compose Message. Type Save when Done
512
User: Type in "Call John at 2025" Press Save Key
514
Display: Call John at 2025 Press Msg Key for Change. Press Send Key to Send
516
User: Press Send Key
518
Display: Type in Phone Number and then Press Send Key
520
User: Press 2,0,0,3, Send Keys
522
Phone #1: Send Data Message Storage Request Command to Phone #2
Phone #2: Send Data Message Storage Ready Command to Phone #1
524
Phone #1: Send "Call John at 2025" Message Data to Phone #2
526
Phone #2: Send Data Message Storage Acknowledge Command to Phone #1
Phone #1: Send End Command to Phone #2
528
Display: Message Sent
530
500

FIG. 20

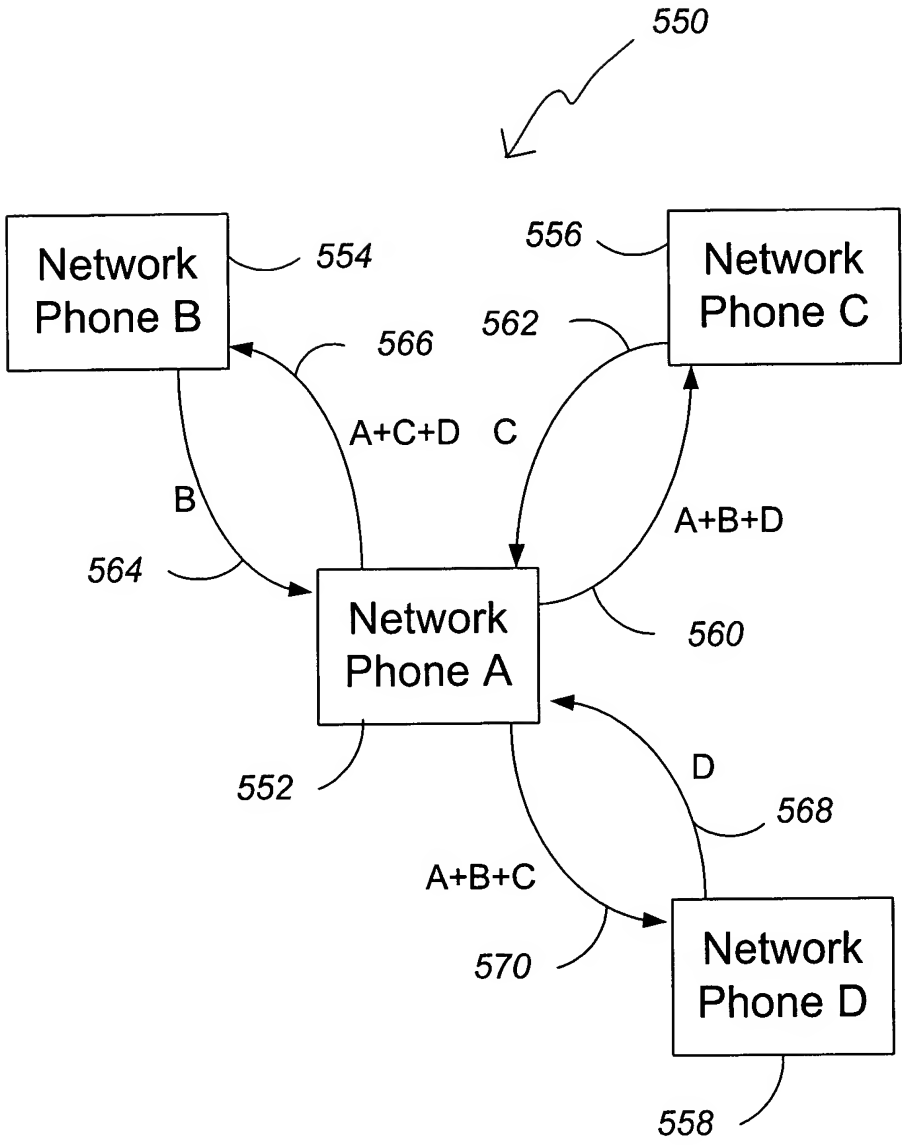

550
Network Phone B
554
556
Network Phone C
566
562
A+C+D
C
B
564
A+B+D
Network Phone A
560
552
D
568
A+B+C
570
Network Phone D
558

FIG. 21

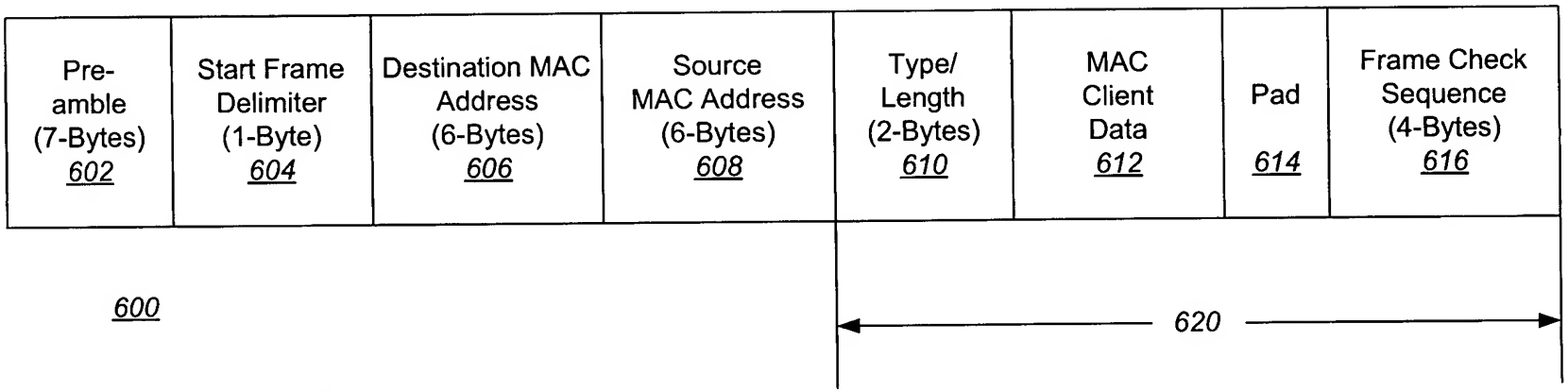


FIG. 22A (Prior Art)

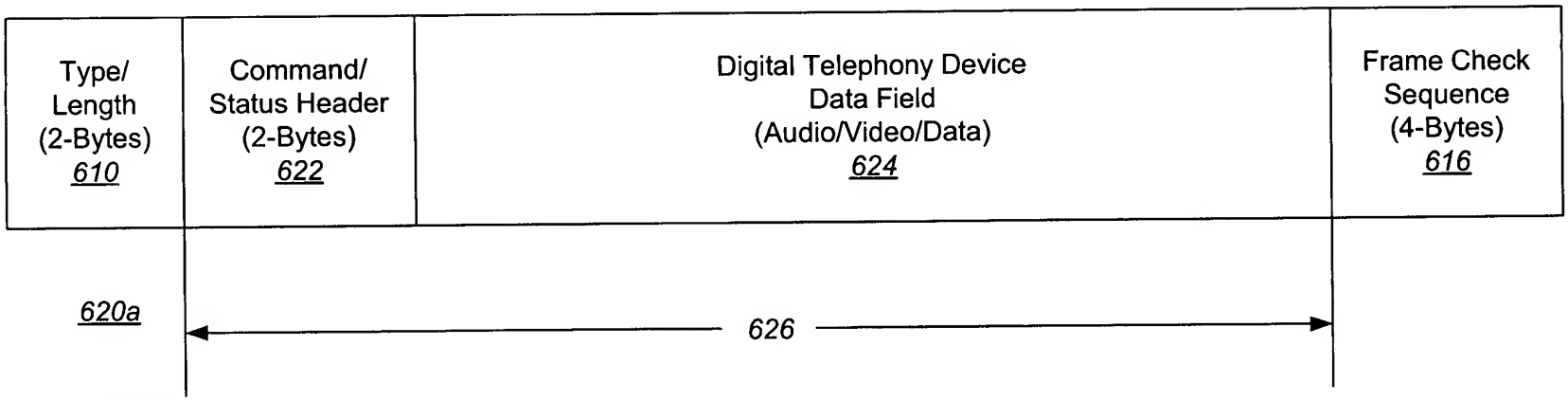


FIG. 22B

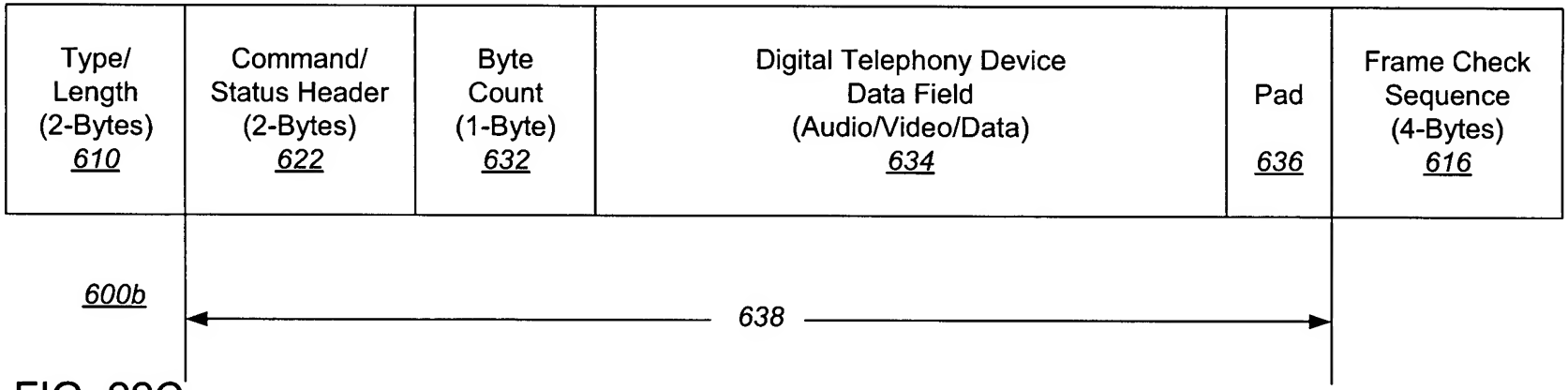


FIG. 22C

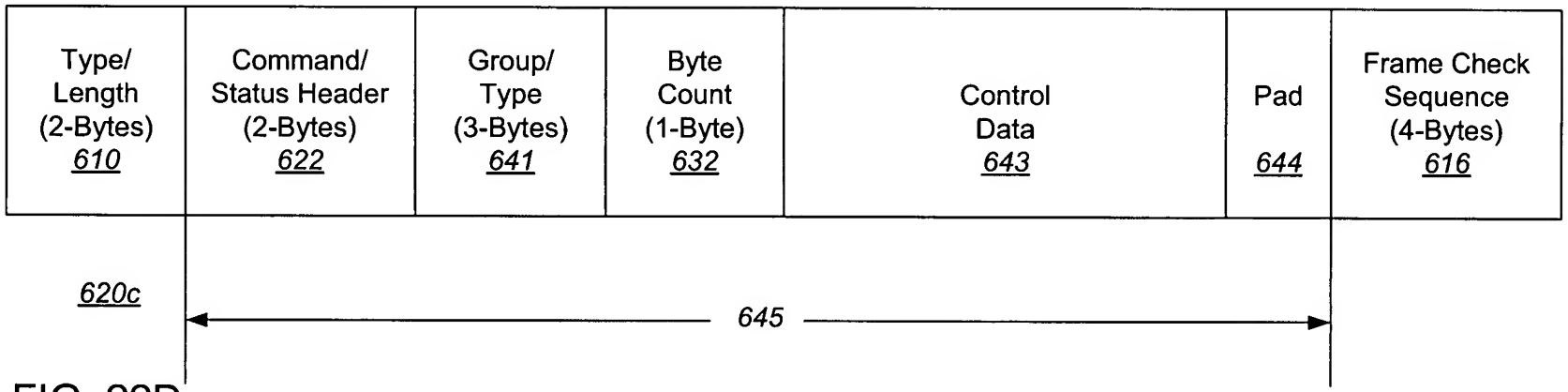
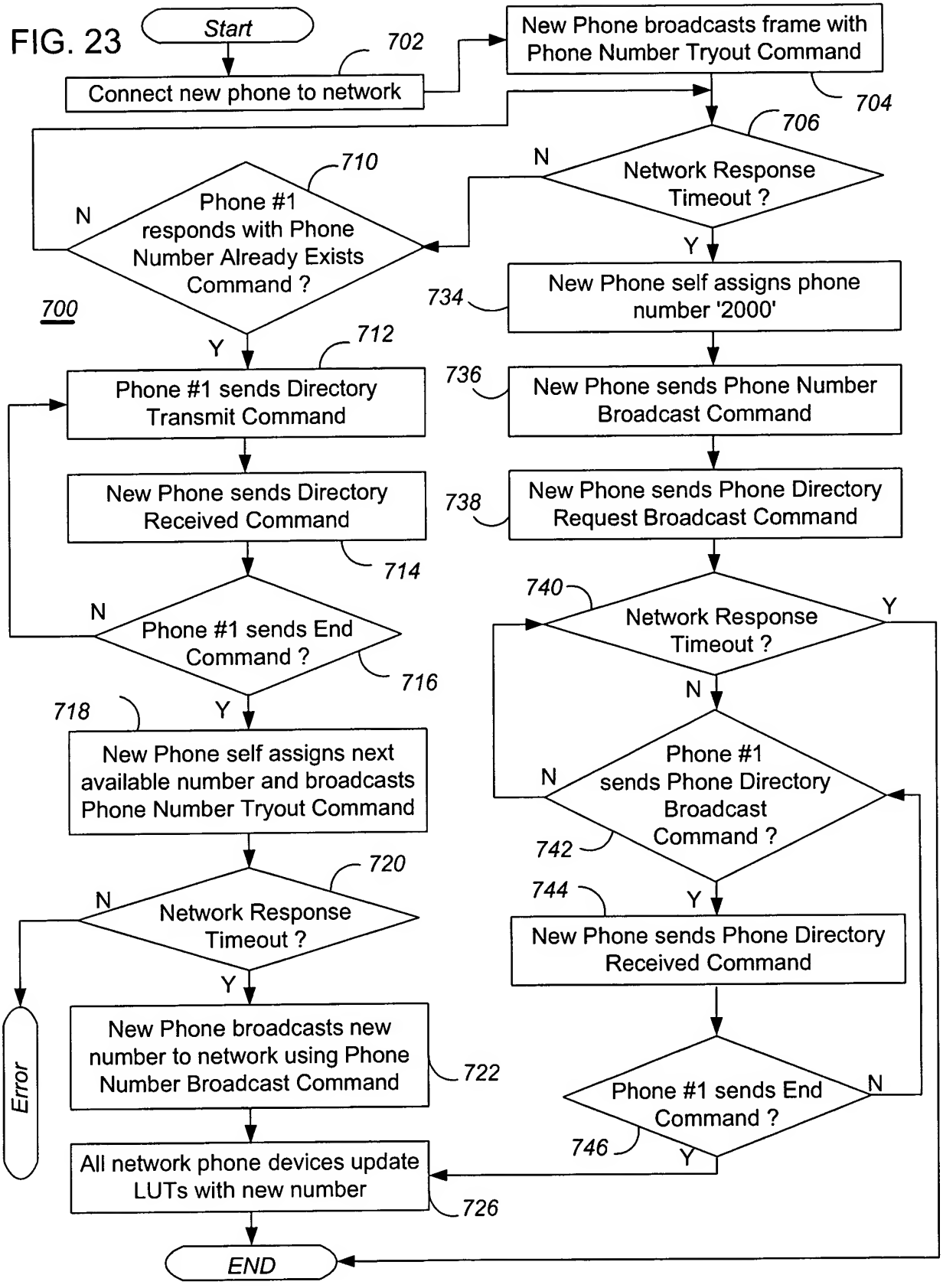


FIG. 22D

FIG. 23


Start
Connect new phone to network
702
New Phone broadcasts frame with Phone Number Tryout Command
704
706
Network Response Timeout ?
N
Y
710
Phone #1 responds with Phone Number Already Exists Command ?
N
Y
700
734
New Phone self assigns phone number '2000'
712
Phone #1 sends Directory Transmit Command
736
New Phone sends Phone Number Broadcast Command
New Phone sends Directory Received Command
738
New Phone sends Phone Directory Request Broadcast Command
714
740
Network Response Timeout ?
Y
N
Phone #1 sends End Command ?
N
716
Y
718
New Phone self assigns next available number and broadcasts Phone Number Tryout Command
Phone #1 sends Phone Directory Broadcast Command ?
N
742
720
Network Response Timeout ?
N
744
Y
New Phone sends Phone Directory Received Command
Error
Y
New Phone broadcasts new number to network using Phone Number Broadcast Command
722
Phone #1 sends End Command ?
N
746
Y
All network phone devices update LUTs with new number
726
END

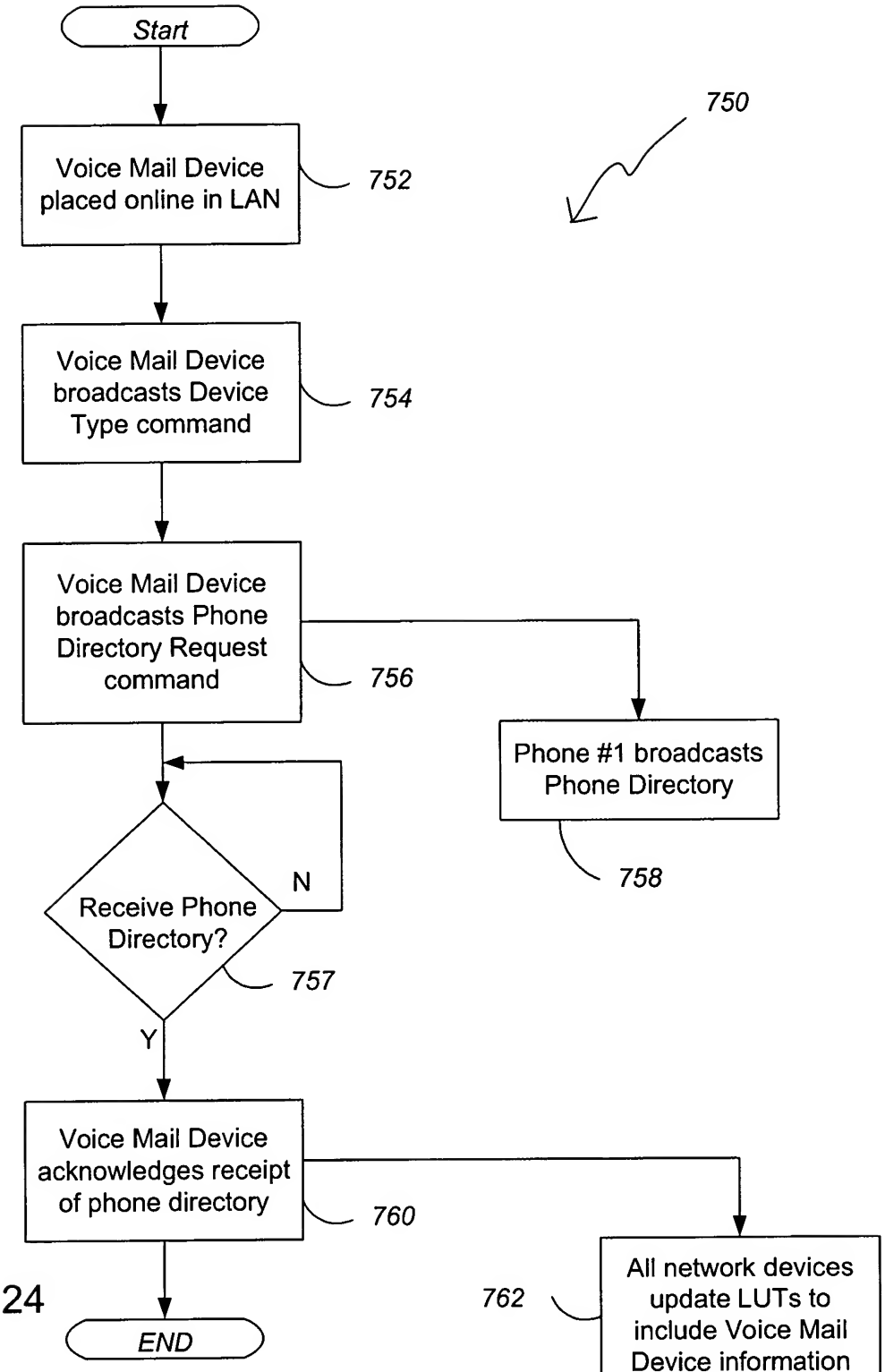

Start
750
Voice Mail Device placed online in LAN
752
Voice Mail Device broadcasts Device Type command
754
Voice Mail Device broadcasts Phone Directory Request command
756
Phone #1 broadcasts Phone Directory
758
Receive Phone Directory?
N
757
Y
Voice Mail Device acknowledges receipt of phone directory
760
All network devices update LUTs to include Voice Mail Device information
762
END

FIG. 24

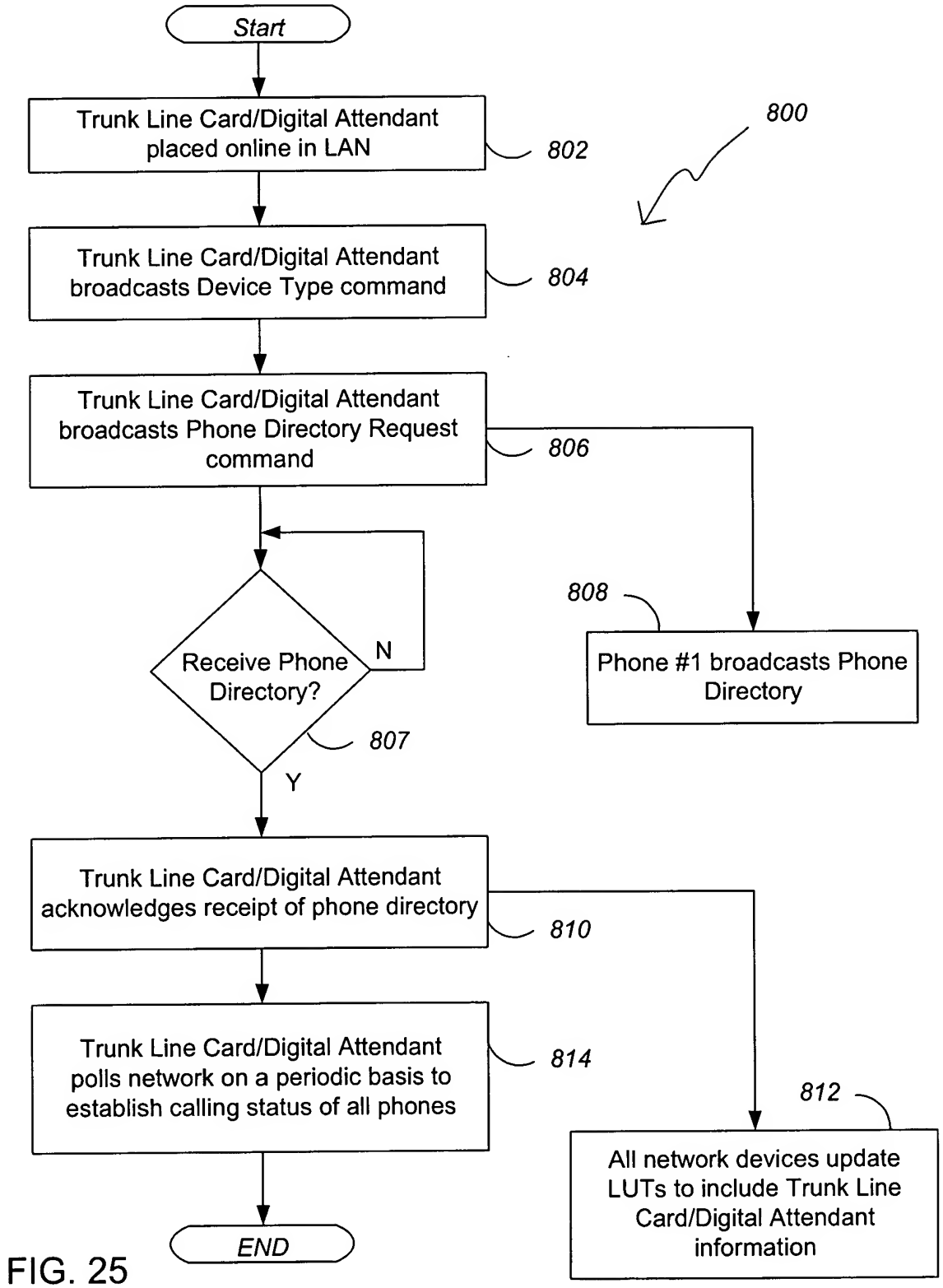

Start
Trunk Line Card/Digital Attendant placed online in LAN
802
800
Trunk Line Card/Digital Attendant broadcasts Device Type command
804
Trunk Line Card/Digital Attendant broadcasts Phone Directory Request command
806
808
Phone #1 broadcasts Phone Directory
Receive Phone Directory?
N
807
Y
Trunk Line Card/Digital Attendant acknowledges receipt of phone directory
810
Trunk Line Card/Digital Attendant polls network on a periodic basis to establish calling status of all phones
814
812
All network devices update LUTs to include Trunk Line Card/Digital Attendant information
END

FIG. 25

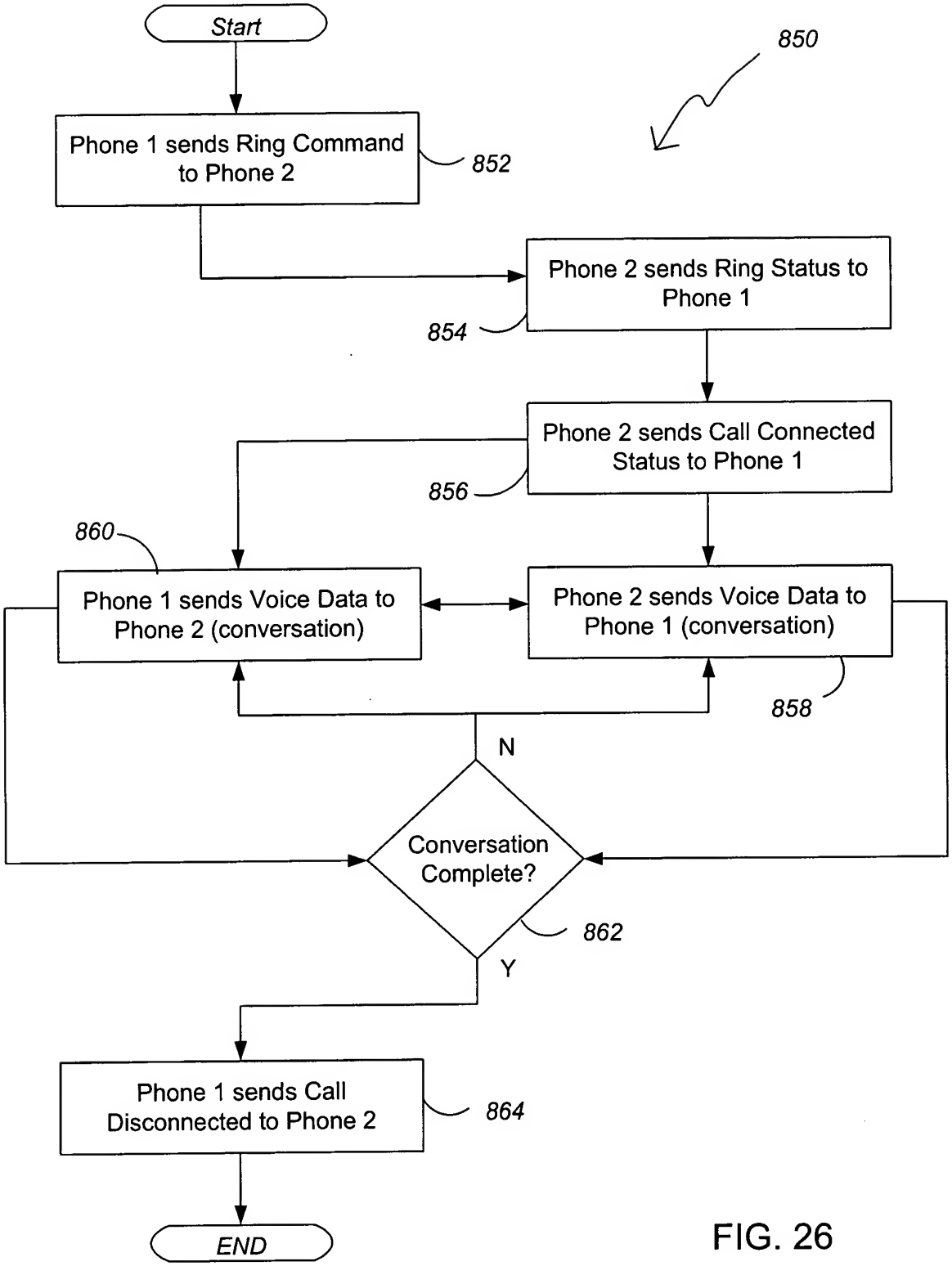

Start
850
Phone 1 sends Ring Command to Phone 2
852
Phone 2 sends Ring Status to Phone 1
854
Phone 2 sends Call Connected Status to Phone 1
856
860
Phone 1 sends Voice Data to Phone 2 (conversation)
Phone 2 sends Voice Data to Phone 1 (conversation)
858
N
Conversation Complete?
862
Y
Phone 1 sends Call Disconnected to Phone 2
864
END

FIG. 26

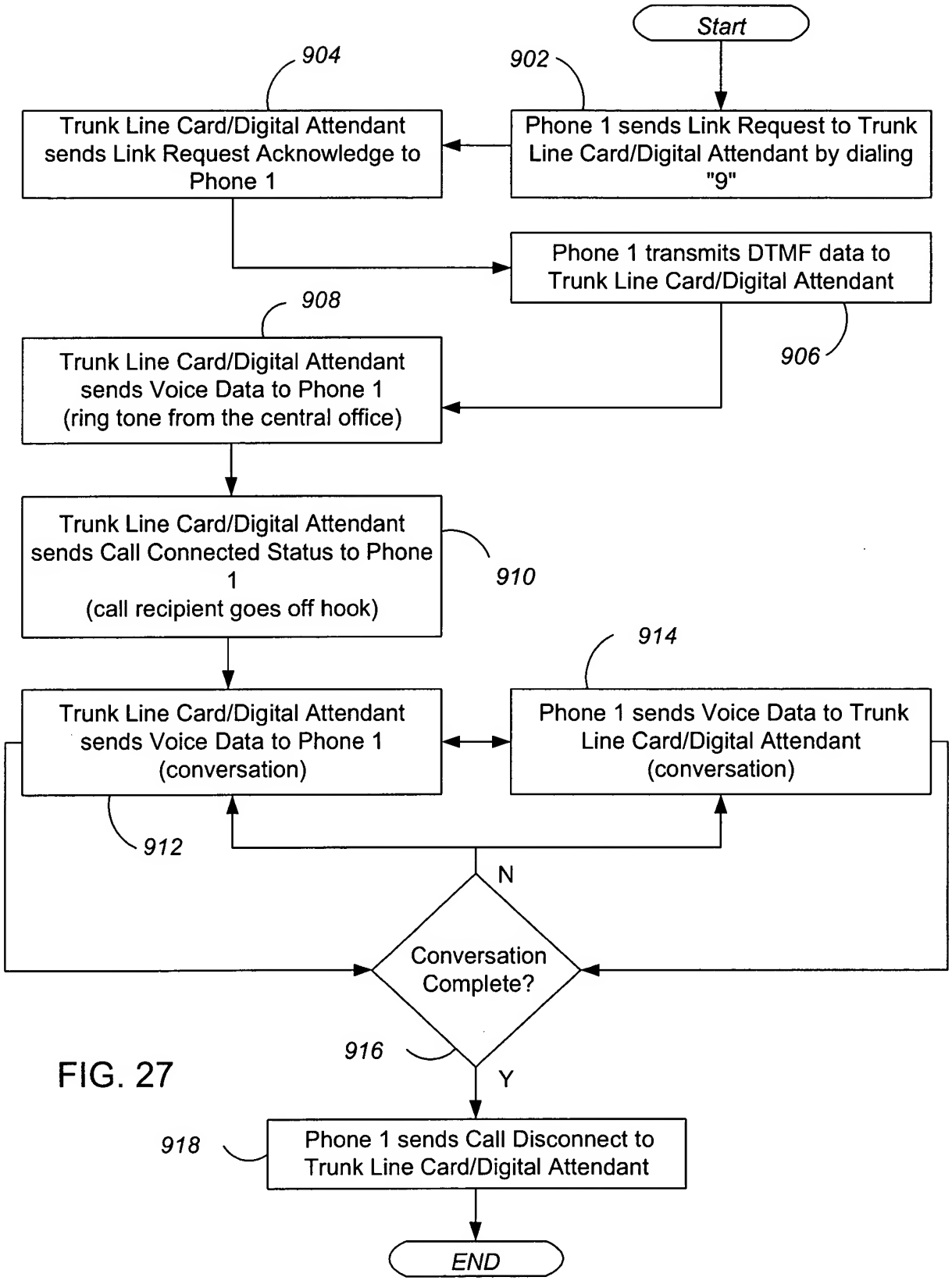

Start
902
Phone 1 sends Link Request to Trunk Line Card/Digital Attendant by dialing "9"
904
Trunk Line Card/Digital Attendant sends Link Request Acknowledge to Phone 1
Phone 1 transmits DTMF data to Trunk Line Card/Digital Attendant
906
908
Trunk Line Card/Digital Attendant sends Voice Data to Phone 1 (ring tone from the central office)
Trunk Line Card/Digital Attendant sends Call Connected Status to Phone 1 (call recipient goes off hook)
910
914
Phone 1 sends Voice Data to Trunk Line Card/Digital Attendant (conversation)
Trunk Line Card/Digital Attendant sends Voice Data to Phone 1 (conversation)
912
N
Conversation Complete?
916
Y
918
Phone 1 sends Call Disconnect to Trunk Line Card/Digital Attendant
END

FIG. 27

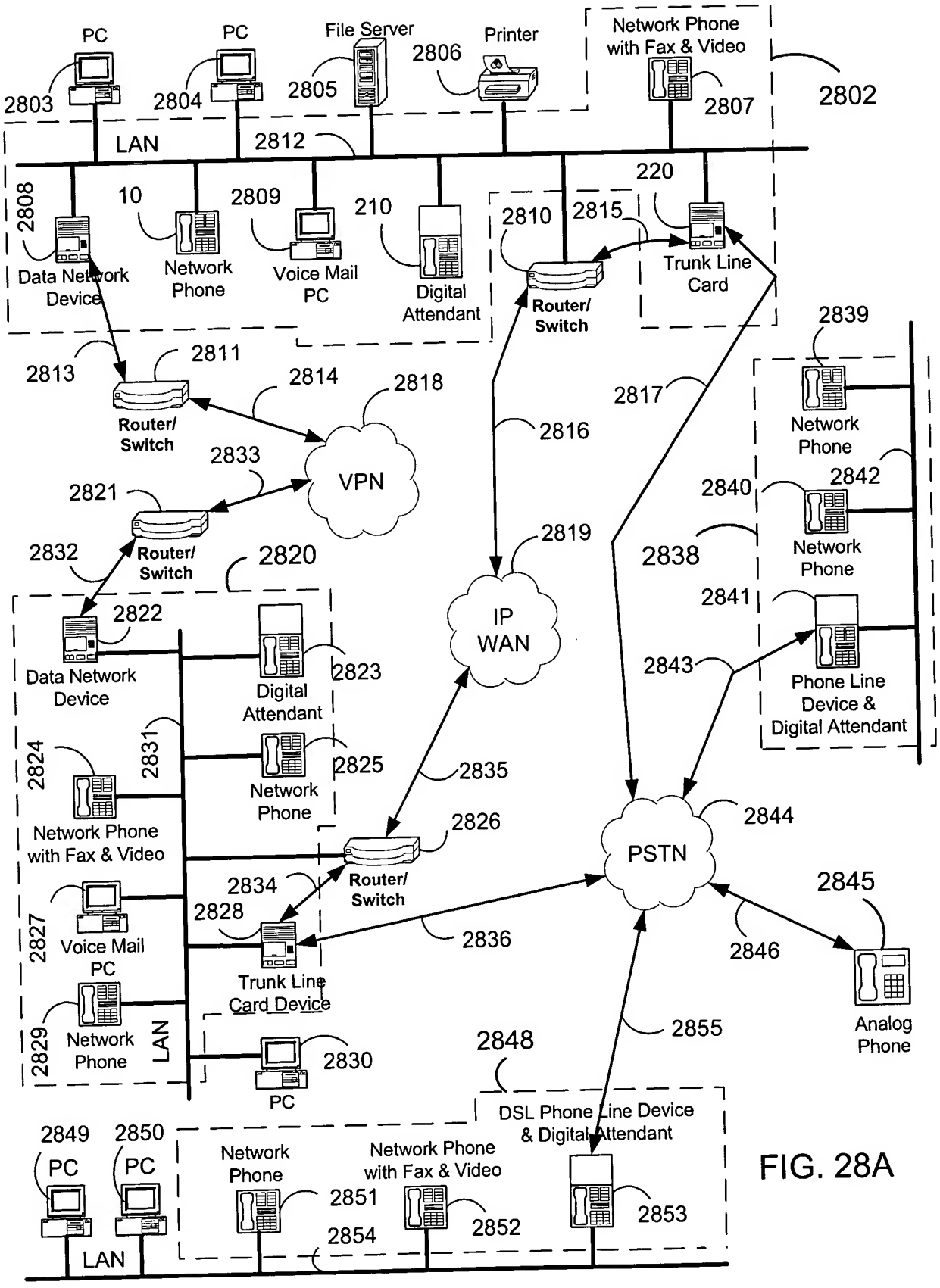

PC
PC
File Server
Printer
Network Phone with Fax & Video
2803
2804
2805
2806
2807
2802
LAN
2812
2808
10
2809
210
220
2810
2815
Data Network Device
Network Phone
Voice Mail PC
Digital Attendant
Router/ Switch
Trunk Line Card
2813
2811
2814
2818
2816
2817
2839
Router/ Switch
VPN
Network Phone
2833
2821
2840
2842
2838
2819
2832
Router/ Switch
2820
Network Phone
2841
IP WAN
2822
2843
Data Network Device
2823
Digital Attendant
Phone Line Device & Digital Attendant
2824
2831
2825
2835
Network Phone
Network Phone with Fax & Video
2826
2844
PSTN
2834
2828
Router/ Switch
2845
2827
2836
2846
Voice Mail PC
Trunk Line Card Device
Analog Phone
2829
Network Phone
LAN
2855
2848
2830
PC
DSL Phone Line Device & Digital Attendant
2849
2850
PC
PC
Network Phone
Network Phone with Fax & Video
2851
2853
2852
2854
LAN

FIG. 28A

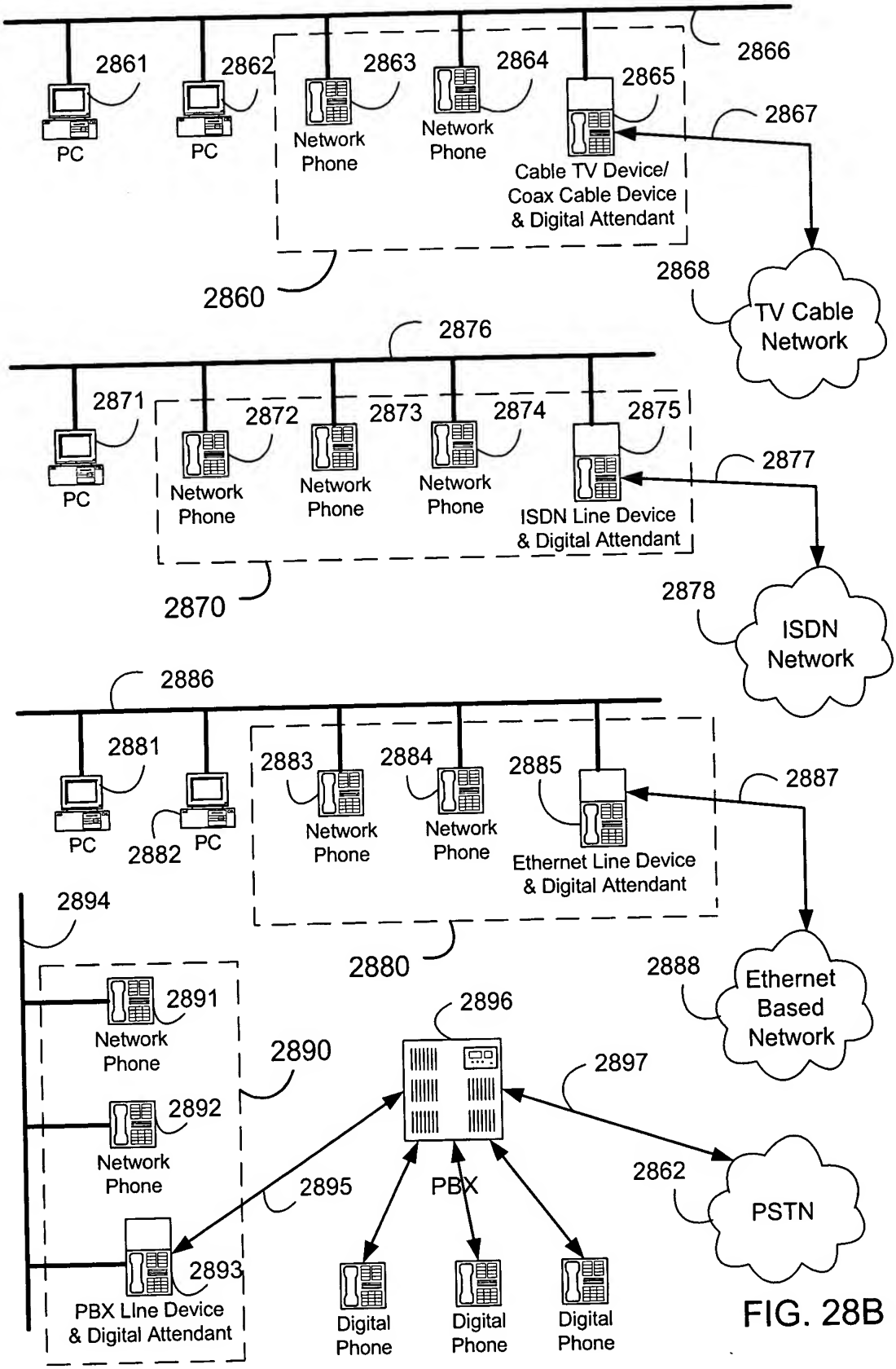

2861
2862
2863
2864
2865
2866
2867
PC
PC
Network Phone
Network Phone
Cable TV Device/ Coax Cable Device & Digital Attendant
2860
2868
TV Cable Network
2876
2871
2872
2873
2874
2875
2877
PC
Network Phone
Network Phone
Network Phone
ISDN Line Device & Digital Attendant
2870
2878
ISDN Network
2886
2881
2883
2884
2885
2887
PC
2882
PC
Network Phone
Network Phone
Ethernet Line Device & Digital Attendant
2894
2880
2888
Ethernet Based Network
2891
2896
Network Phone
2890
2897
2892
Network Phone
2895
PBX
2862
PSTN
2893
PBX LIne Device & Digital Attendant
Digital Phone
Digital Phone
Digital Phone

FIG. 28B

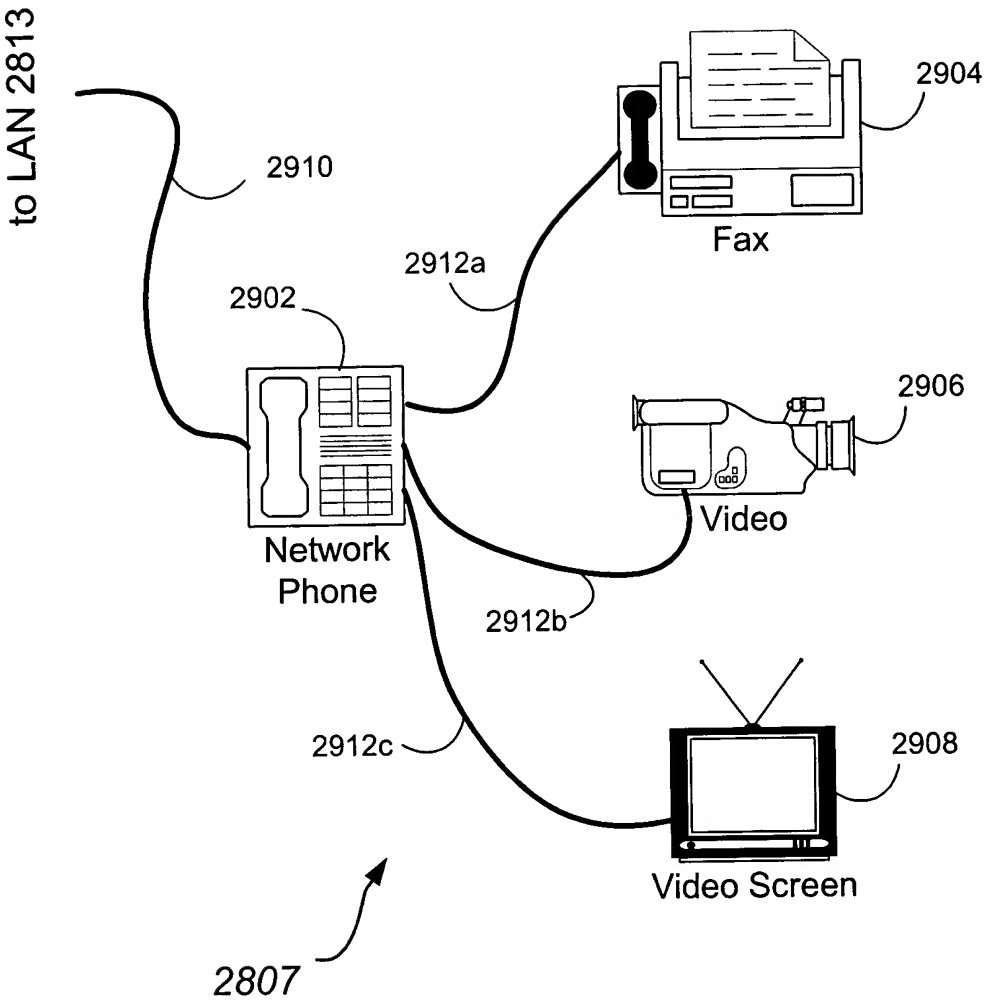
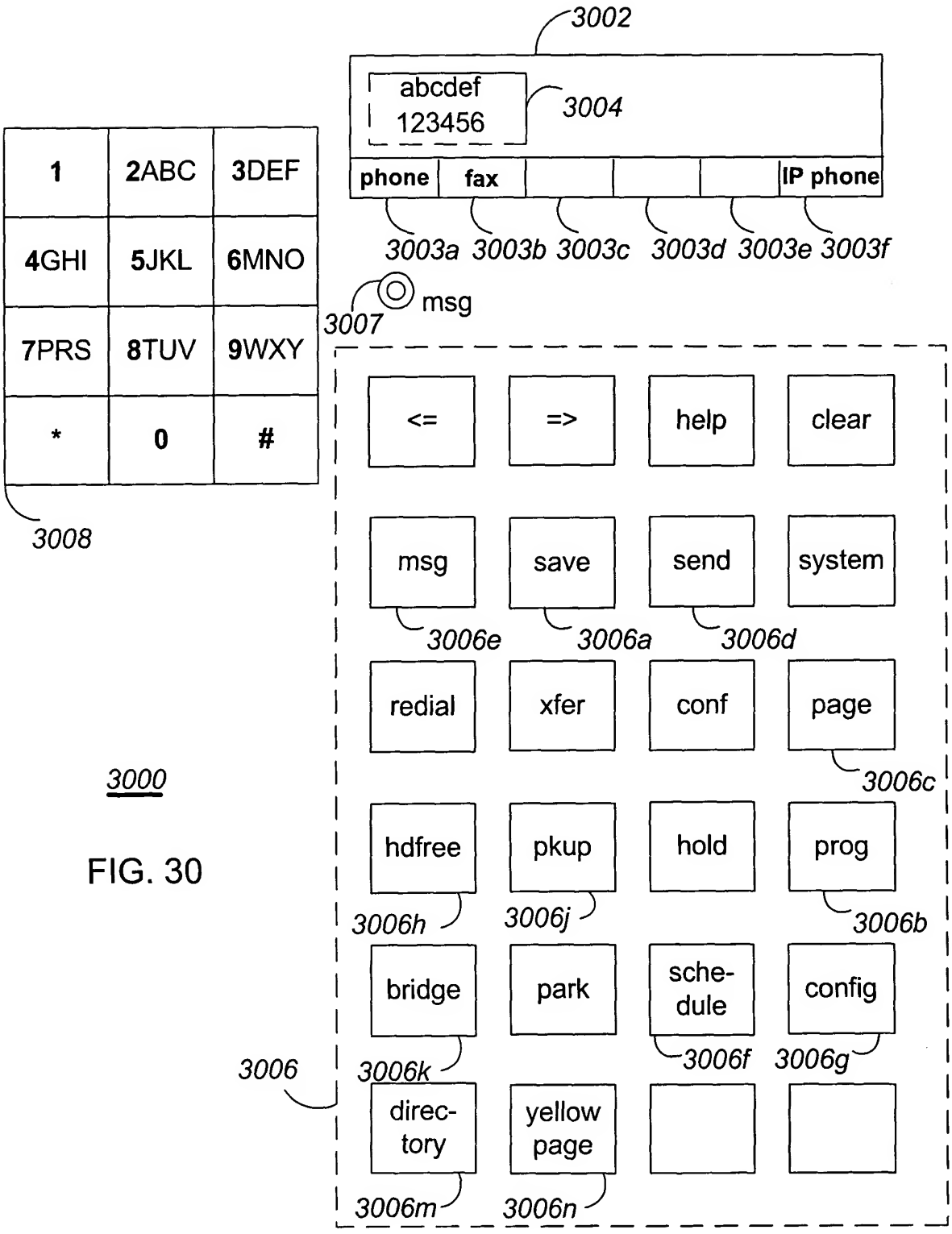
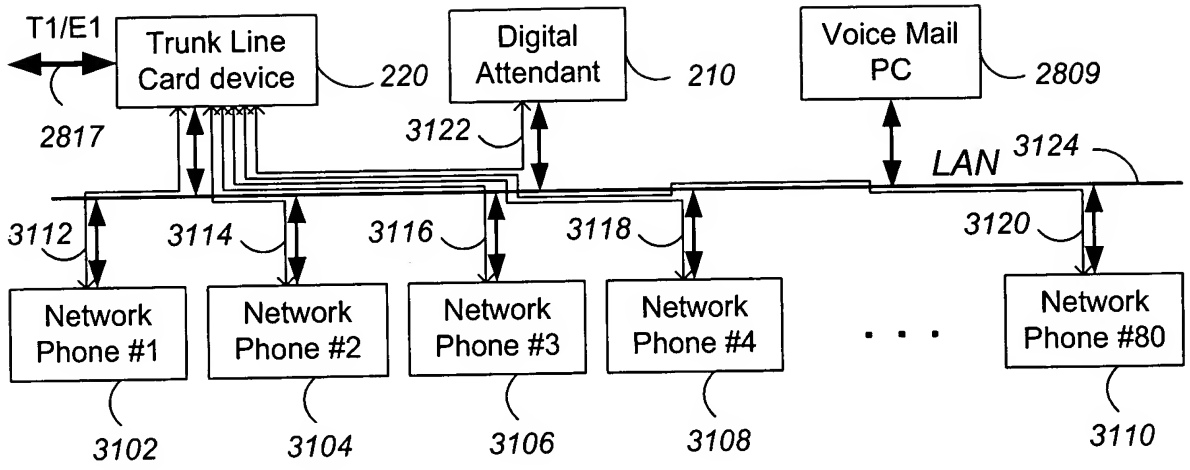

to LAN 2813
2910
2904
Fax
2912a
2902
2906
Video
Network
Phone
2912b
2912c
2908
Video Screen
2807

FIG. 29


3002
abcdef
123456
3004
phone
fax
IP phone
3003a
3003b
3003c
3003d
3003e
3003f
msg
3007
1
2ABC
3DEF
4GHI
5JKL
6MNO
7PRS
8TUV
9WXY
*
0
#
3008
<=
=>
help
clear
msg
save
send
system
3006e
3006a
3006d
redial
xfer
conf
page
3006c
hdfree
pkup
hold
prog
3006h
3006j
3006b
bridge
park
sche-
dule
config
3006k
3006f
3006g
3006
direc-
tory
yellow
page
3006m
3006n

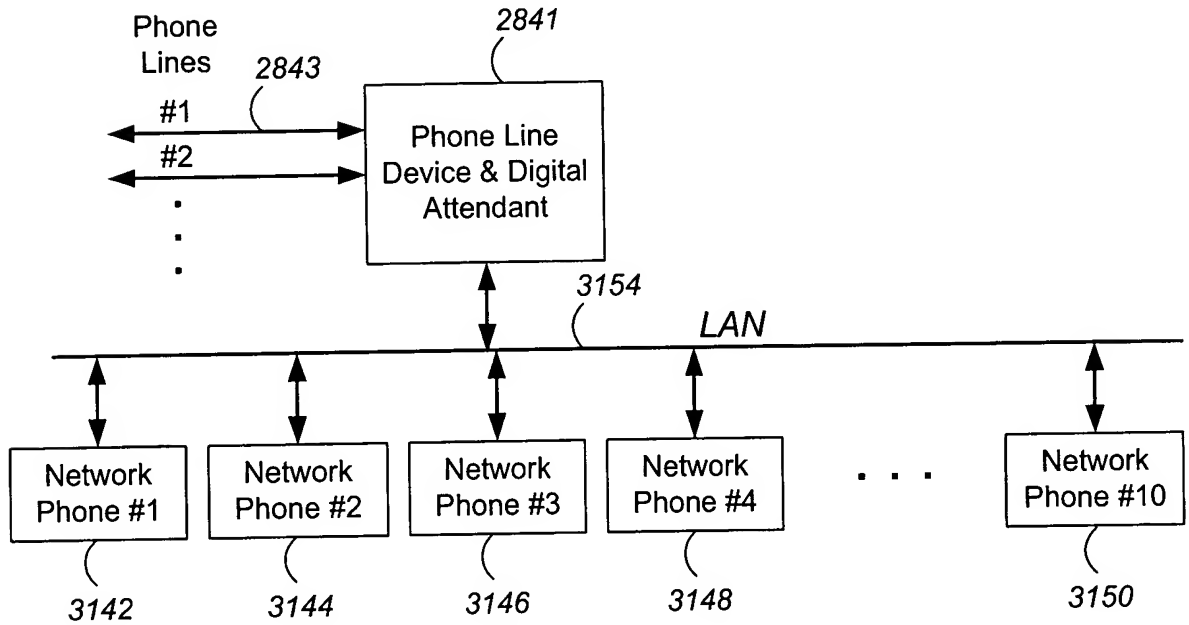
3000

FIG. 30



3100

FIG. 31A



3140

FIG. 31B

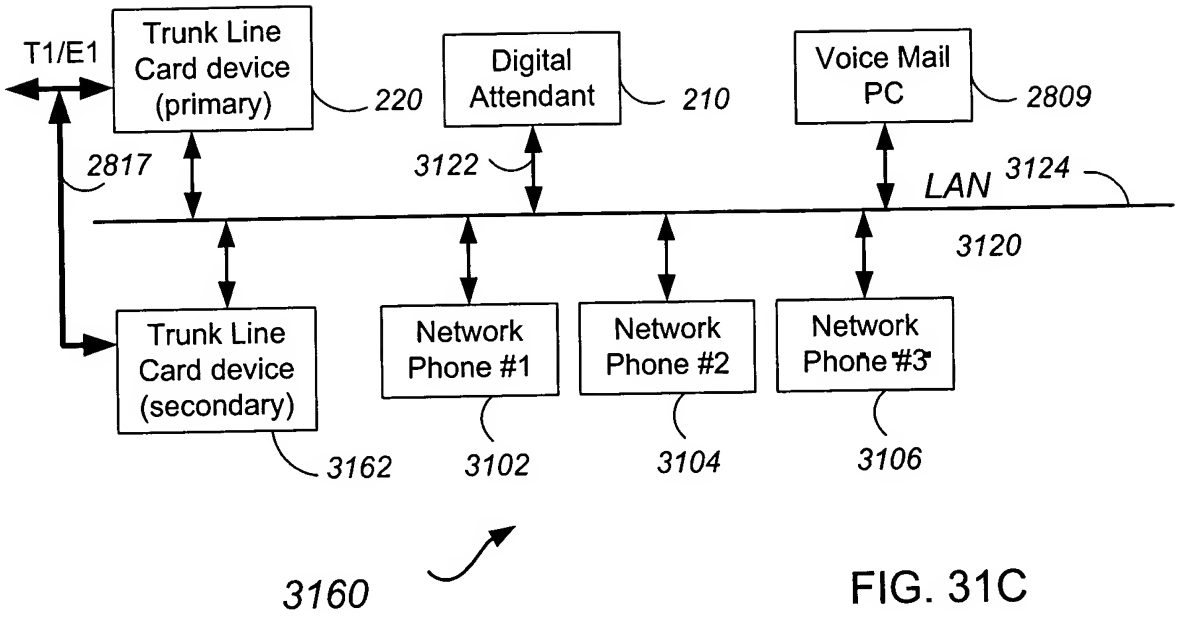


FIG. 31C

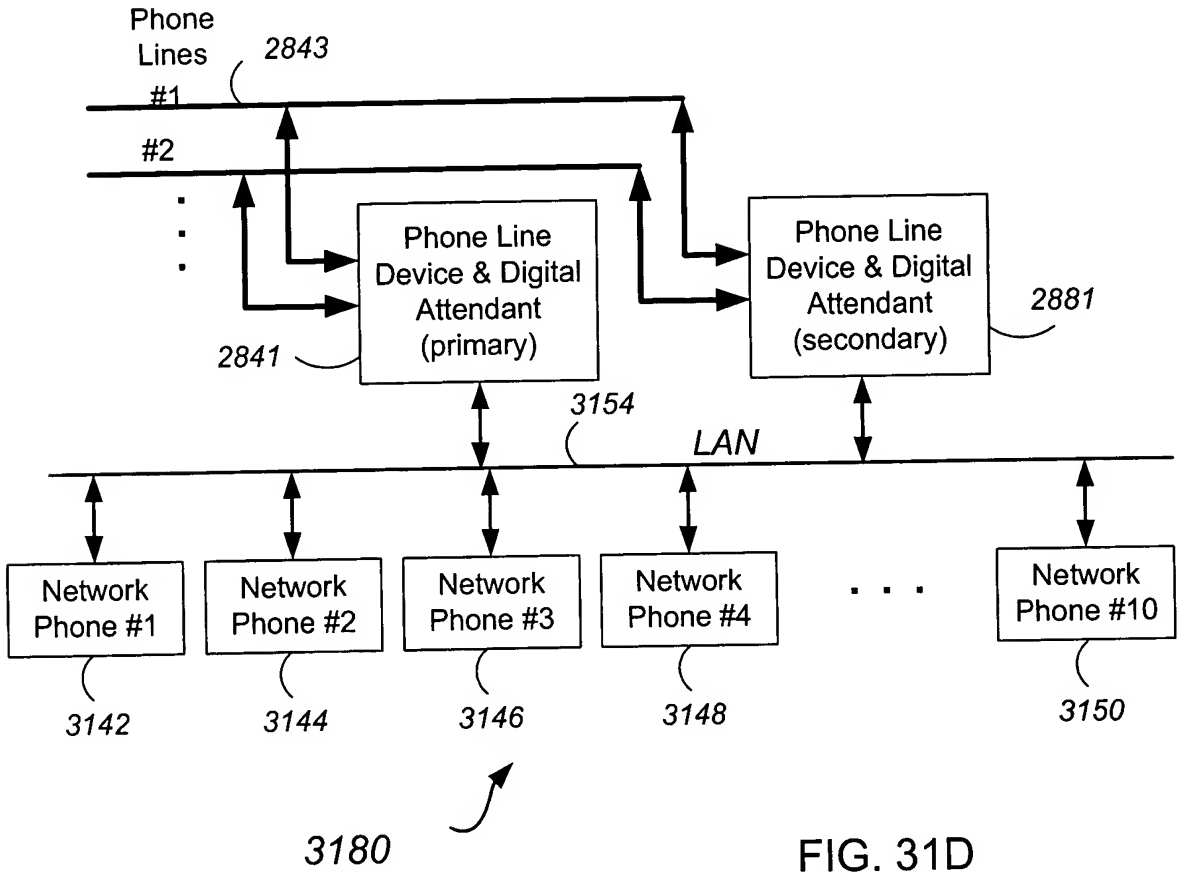


FIG. 31D

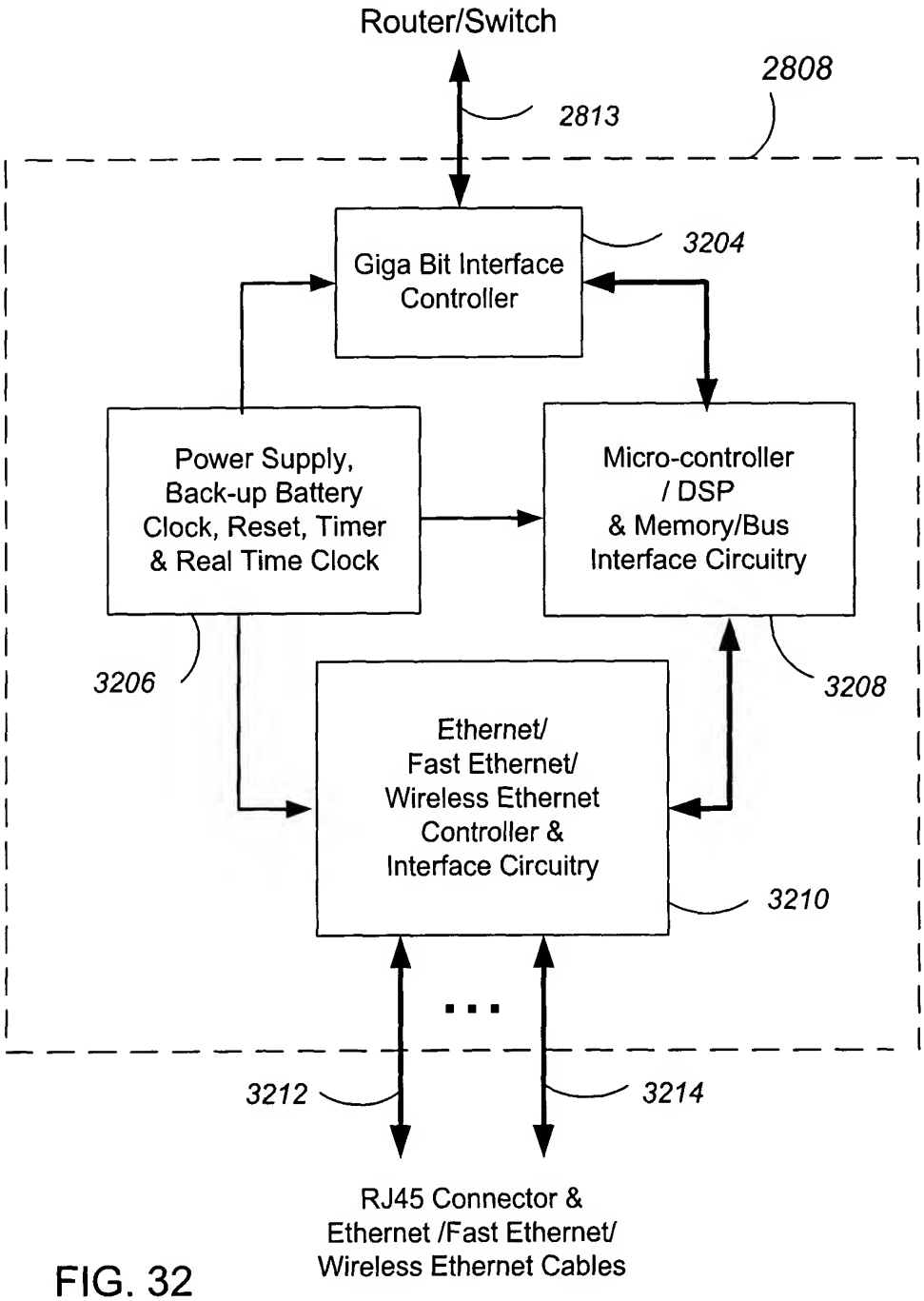

Router/Switch
2808
2813
Giga Bit Interface Controller
3204
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
Micro-controller / DSP & Memory/Bus Interface Circuitry
3206
3208
Ethernet/ Fast Ethernet/ Wireless Ethernet Controller & Interface Circuitry
3210
3212
3214
RJ45 Connector & Ethernet /Fast Ethernet/ Wireless Ethernet Cables

FIG. 32

FIG. 33

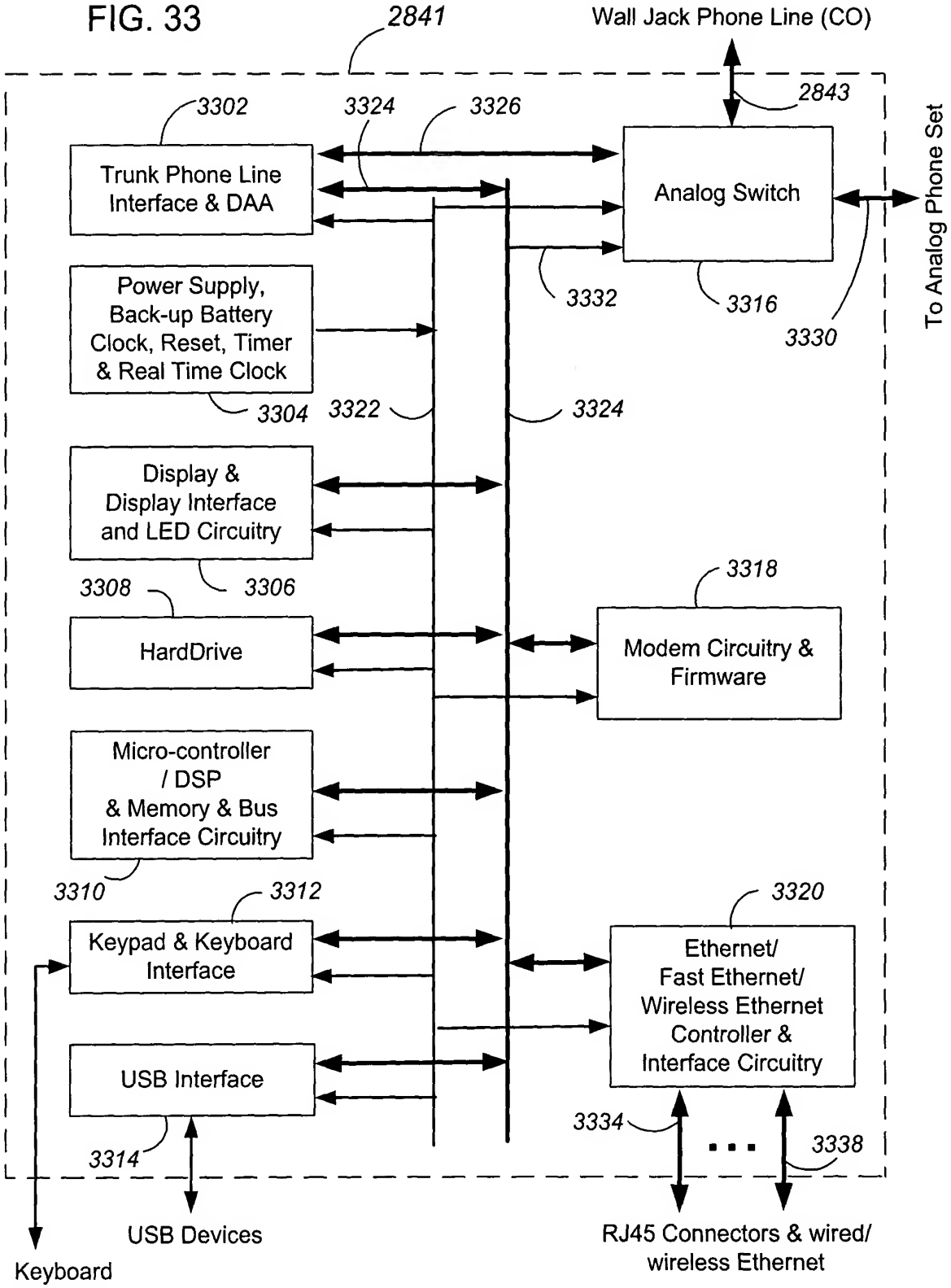

2841
Wall Jack Phone Line (CO)
2843
3302
3324
3326
Trunk Phone Line Interface & DAA
Analog Switch
To Analog Phone Set
3332
3316
3330
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
3304
3322
3324
Display & Display Interface and LED Circuitry
3306
3308
3318
HardDrive
Modem Circuitry & Firmware
Micro-controller / DSP & Memory & Bus Interface Circuitry
3310
3312
3320
Keypad & Keyboard Interface
Ethernet/ Fast Ethernet/ Wireless Ethernet Controller & Interface Circuitry
USB Interface
3334
3338
3314
USB Devices
RJ45 Connectors & wired/ wireless Ethernet
Keyboard

FIG. 34

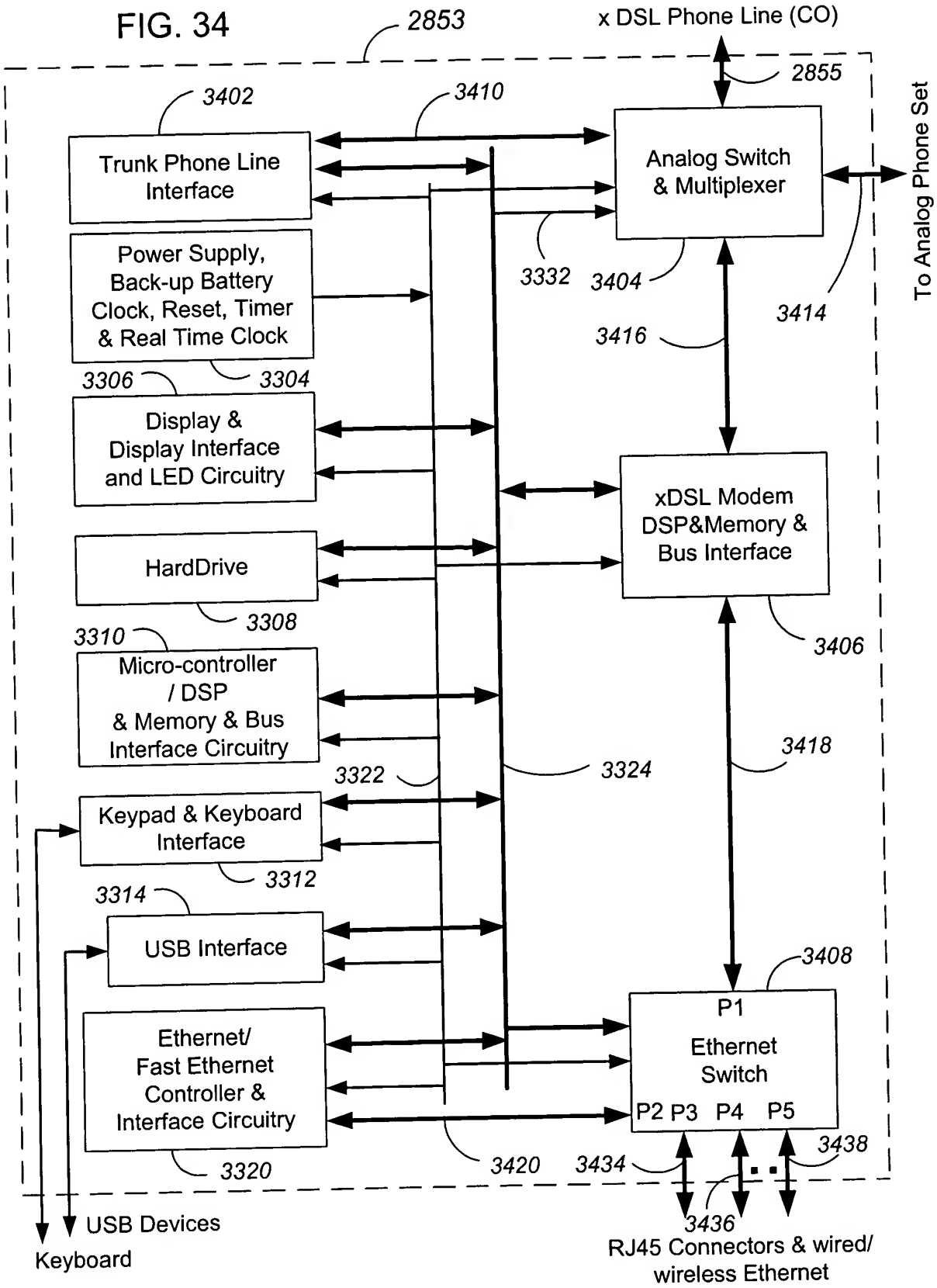

2853
x DSL Phone Line (CO)
2855
To Analog Phone Set
3402
3410
Trunk Phone Line Interface
Analog Switch & Multiplexer
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
3332
3404
3414
3416
3306
3304
Display & Display Interface and LED Circuitry
xDSL Modem DSP&Memory & Bus Interface
HardDrive
3308
3406
3310
Micro-controller / DSP & Memory & Bus Interface Circuitry
3418
3322
3324
Keypad & Keyboard Interface
3312
3314
USB Interface
3408
P1
Ethernet Switch
P2 P3 P4 P5
Ethernet/ Fast Ethernet Controller & Interface Circuitry
3438
3320
3420
3434
3436
USB Devices
Keyboard
RJ45 Connectors & wired/ wireless Ethernet

FIG. 35

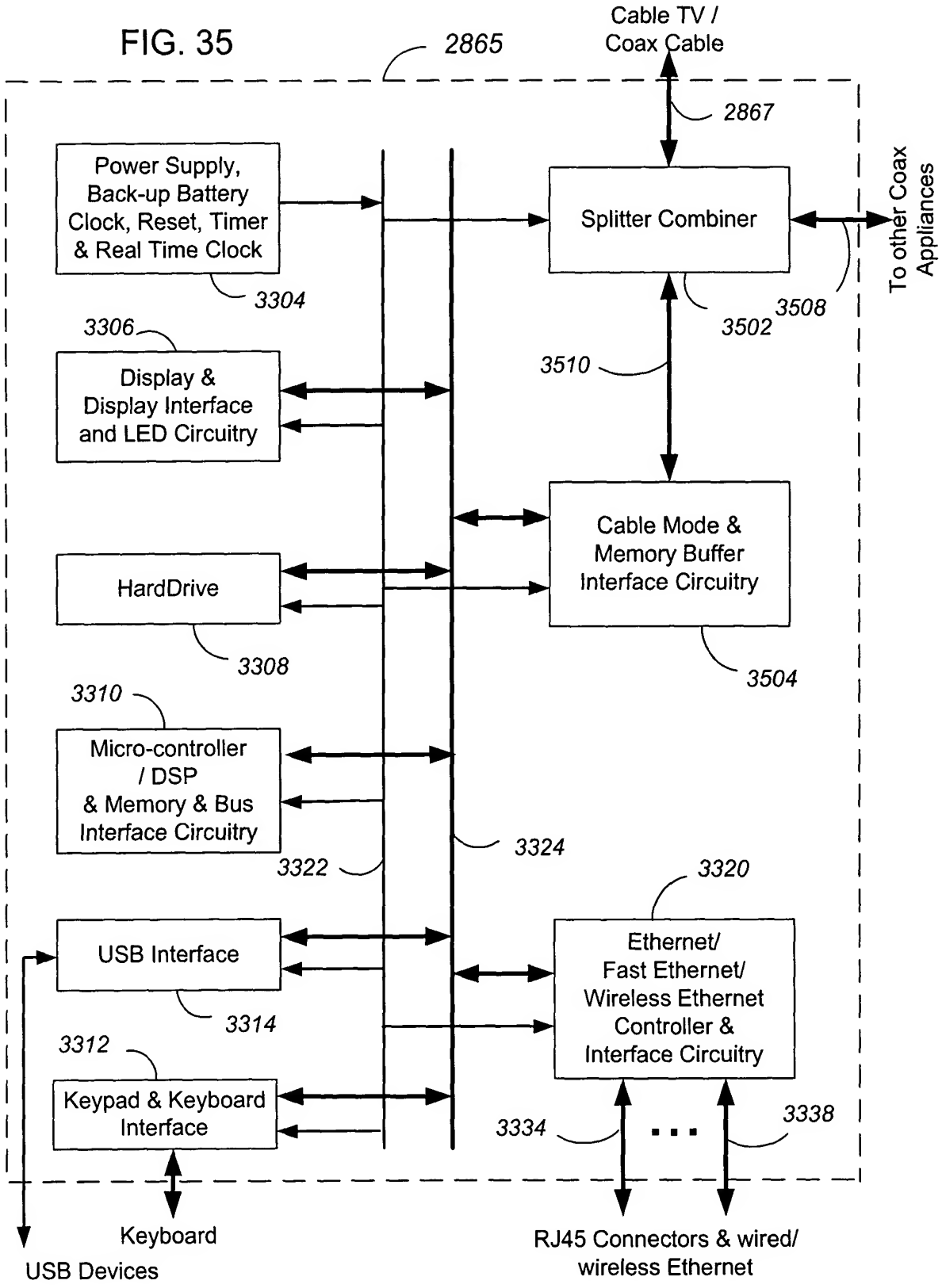

2865
Cable TV / Coax Cable
2867
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
3304
Splitter Combiner
To other Coax Appliances
3508
3502
3306
Display & Display Interface and LED Circuitry
3510
Cable Mode & Memory Buffer Interface Circuitry
3504
HardDrive
3308
3310
Micro-controller / DSP & Memory & Bus Interface Circuitry
3322
3324
3320
USB Interface
3314
Ethernet/ Fast Ethernet/ Wireless Ethernet Controller & Interface Circuitry
3312
Keypad & Keyboard Interface
3334
3338
Keyboard
USB Devices
RJ45 Connectors & wired/ wireless Ethernet

FIG. 36

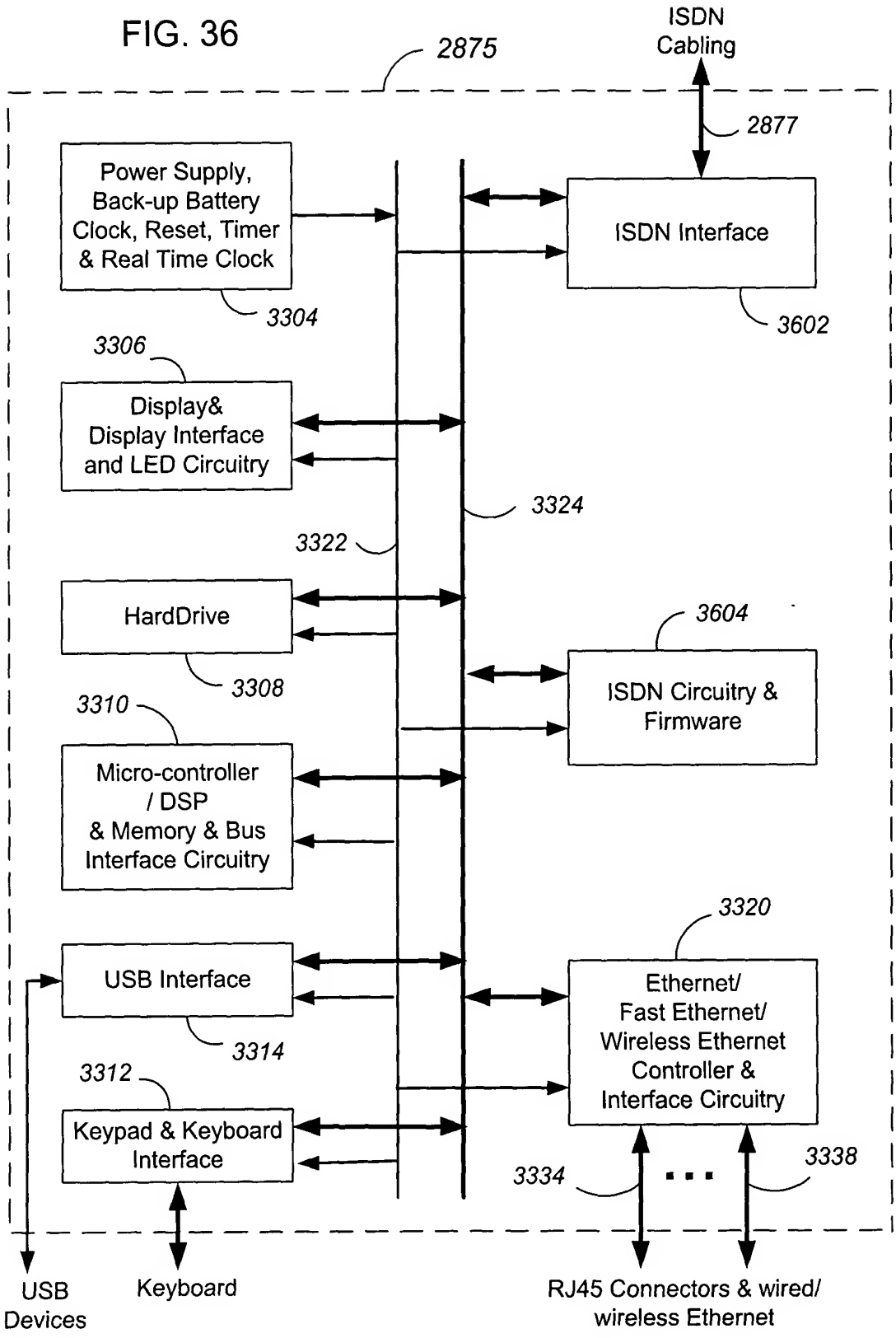

2875
ISDN Cabling
2877
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
3304
ISDN Interface
3602
3306
Display& Display Interface and LED Circuitry
3324
3322
HardDrive
3308
3604
ISDN Circuitry & Firmware
3310
Micro-controller / DSP & Memory & Bus Interface Circuitry
3320
USB Interface
3314
Ethernet/ Fast Ethernet/ Wireless Ethernet Controller & Interface Circuitry
3312
Keypad & Keyboard Interface
3334
3338
USB Devices
Keyboard
RJ45 Connectors & wired/ wireless Ethernet

FIG. 37

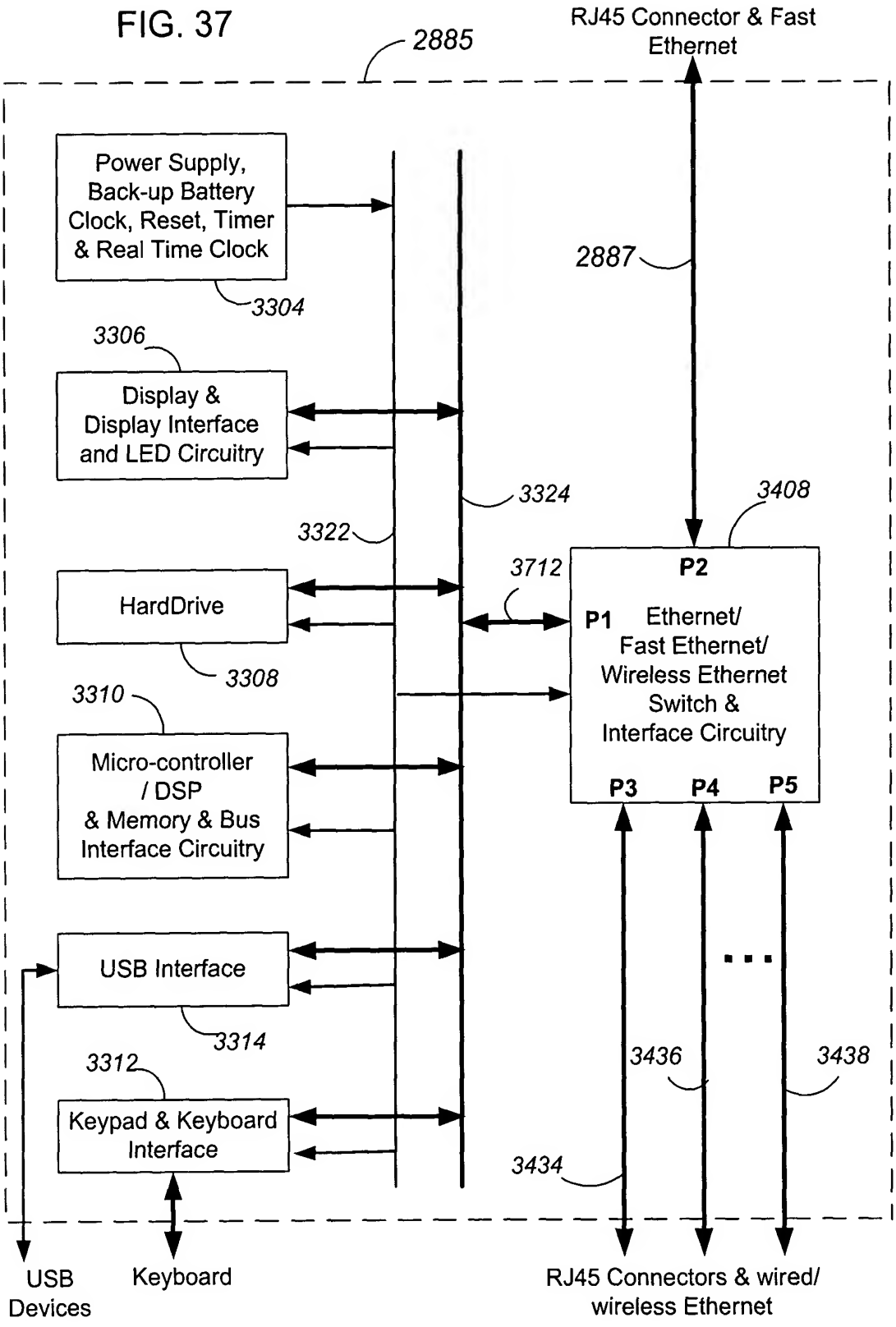

2885
RJ45 Connector & Fast Ethernet
Power Supply, Back-up Battery Clock, Reset, Timer & Real Time Clock
3304
2887
3306
Display & Display Interface and LED Circuitry
3324
3408
3322
3712
P2
HardDrive
P1 Ethernet/ Fast Ethernet/ Wireless Ethernet Switch & Interface Circuitry
3308
3310
Micro-controller / DSP & Memory & Bus Interface Circuitry
P3
P4
P5
USB Interface
3314
3436
3438
3312
Keypad & Keyboard Interface
3434
USB Devices
Keyboard
RJ45 Connectors & wired/ wireless Ethernet

FIG. 38

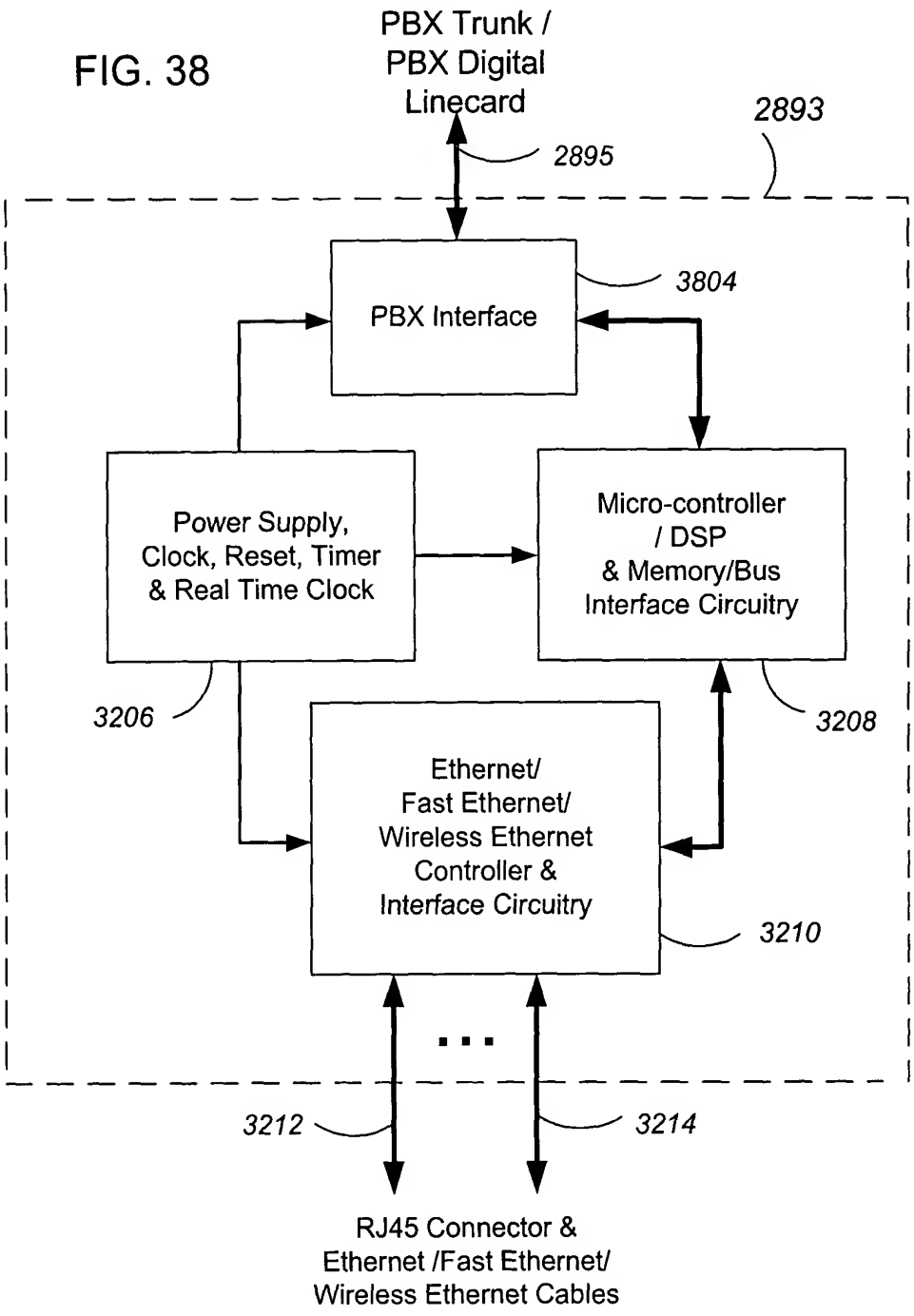
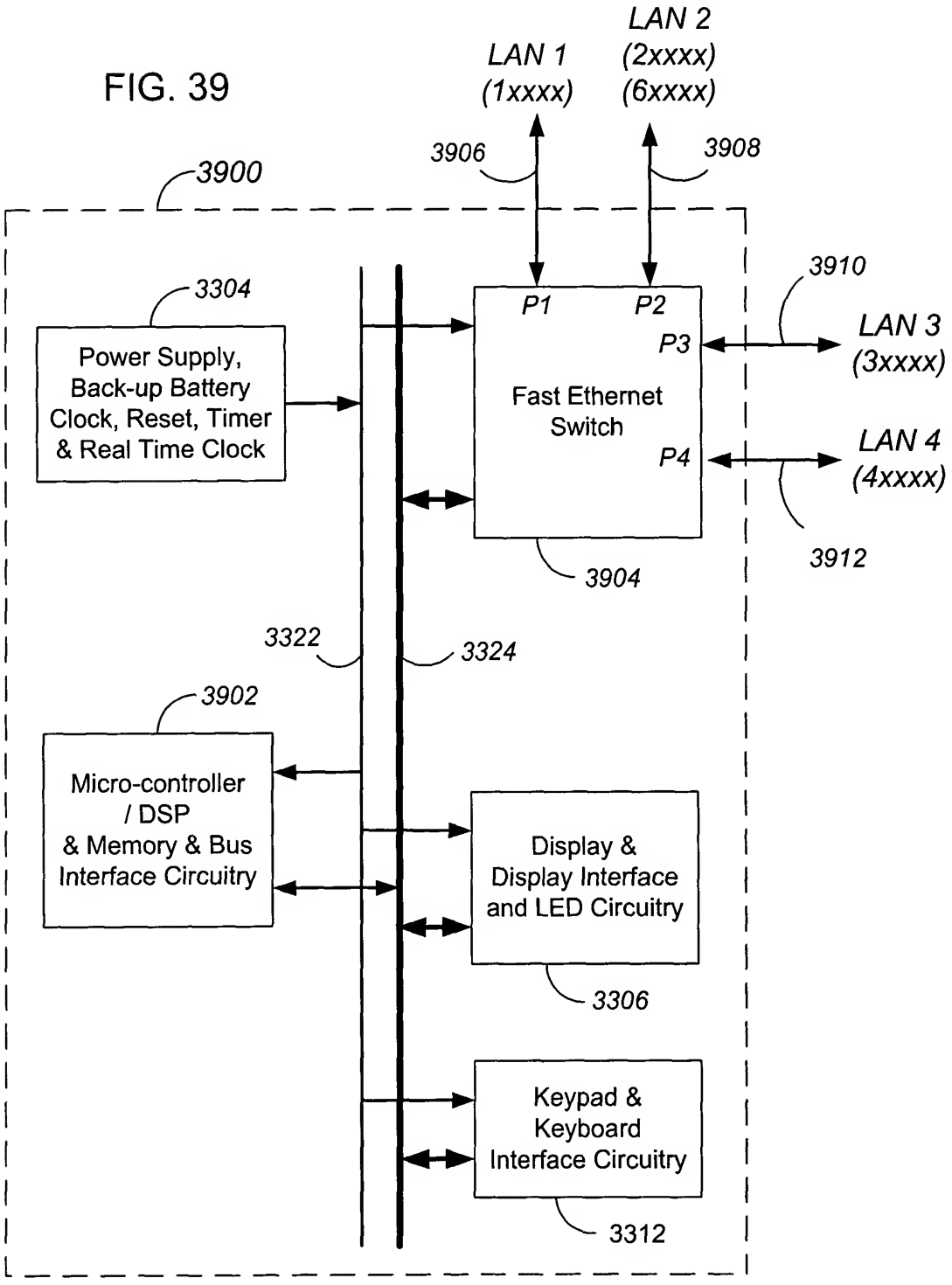

PBX Trunk / PBX Digital Linecard
2895
2893
PBX Interface
3804
Power Supply, Clock, Reset, Timer & Real Time Clock
Micro-controller / DSP & Memory/Bus Interface Circuitry
3206
3208
Ethernet/ Fast Ethernet/ Wireless Ethernet Controller & Interface Circuitry
3210
3212
3214
RJ45 Connector & Ethernet /Fast Ethernet/ Wireless Ethernet Cables

FIG. 39


LAN 1
(1xxxx)
LAN 2
(2xxxx)
(6xxxx)
3906
3908
3900
3910
3304
P1
P2
P3
LAN 3
(3xxxx)
Power Supply,
Back-up Battery
Clock, Reset, Timer
& Real Time Clock
Fast Ethernet
Switch
P4
LAN 4
(4xxxx)
3912
3904
3322
3324
3902
Micro-controller
/ DSP
& Memory & Bus
Interface Circuitry
Display &
Display Interface
and LED Circuitry
3306
Keypad &
Keyboard
Interface Circuitry
3312

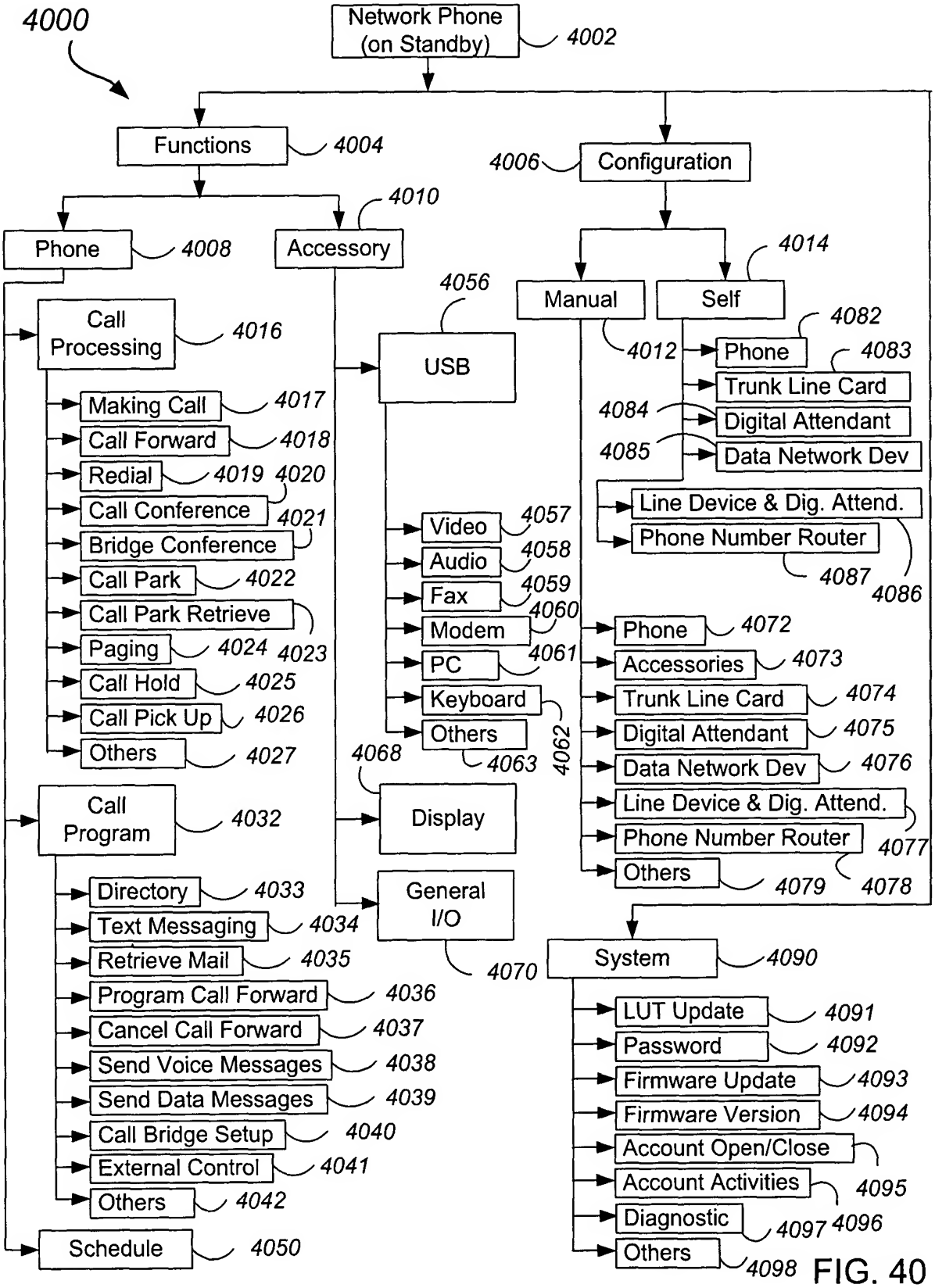

4000
Network Phone (on Standby)
4002
Functions
4004
4006
Configuration
4010
Phone
4008
Accessory
4014
Manual
Self
4056
Call Processing
4016
USB
4012
4082
Phone
4083
Trunk Line Card
4084
Digital Attendant
4085
Data Network Dev
Line Device & Dig. Attend.
Phone Number Router
4087
4086
Making Call
4017
Call Forward
4018
Redial
4019
4020
Call Conference
4021
Bridge Conference
Call Park
4022
Call Park Retrieve
Paging
4024
4023
Call Hold
4025
Call Pick Up
4026
Others
4027
Video
4057
Audio
4058
Fax
4059
Modem
4060
PC
4061
Keyboard
Others
4063
4062
4072
Accessories
4073
Trunk Line Card
4074
Digital Attendant
4075
Data Network Dev
4076
Line Device & Dig. Attend.
4077
Phone Number Router
Others
4079
4078
4068
Call Program
4032
Display
Directory
4033
Text Messaging
4034
Retrieve Mail
4035
Program Call Forward
4036
Cancel Call Forward
4037
Send Voice Messages
4038
Send Data Messages
4039
Call Bridge Setup
4040
External Control
4041
Others
4042
General I/O
4070
System
4090
LUT Update
4091
Password
4092
Firmware Update
4093
Firmware Version
4094
Account Open/Close
Account Activities
4095
Diagnostic
4097
4096
Others
4098
Schedule
4050

FIG. 40

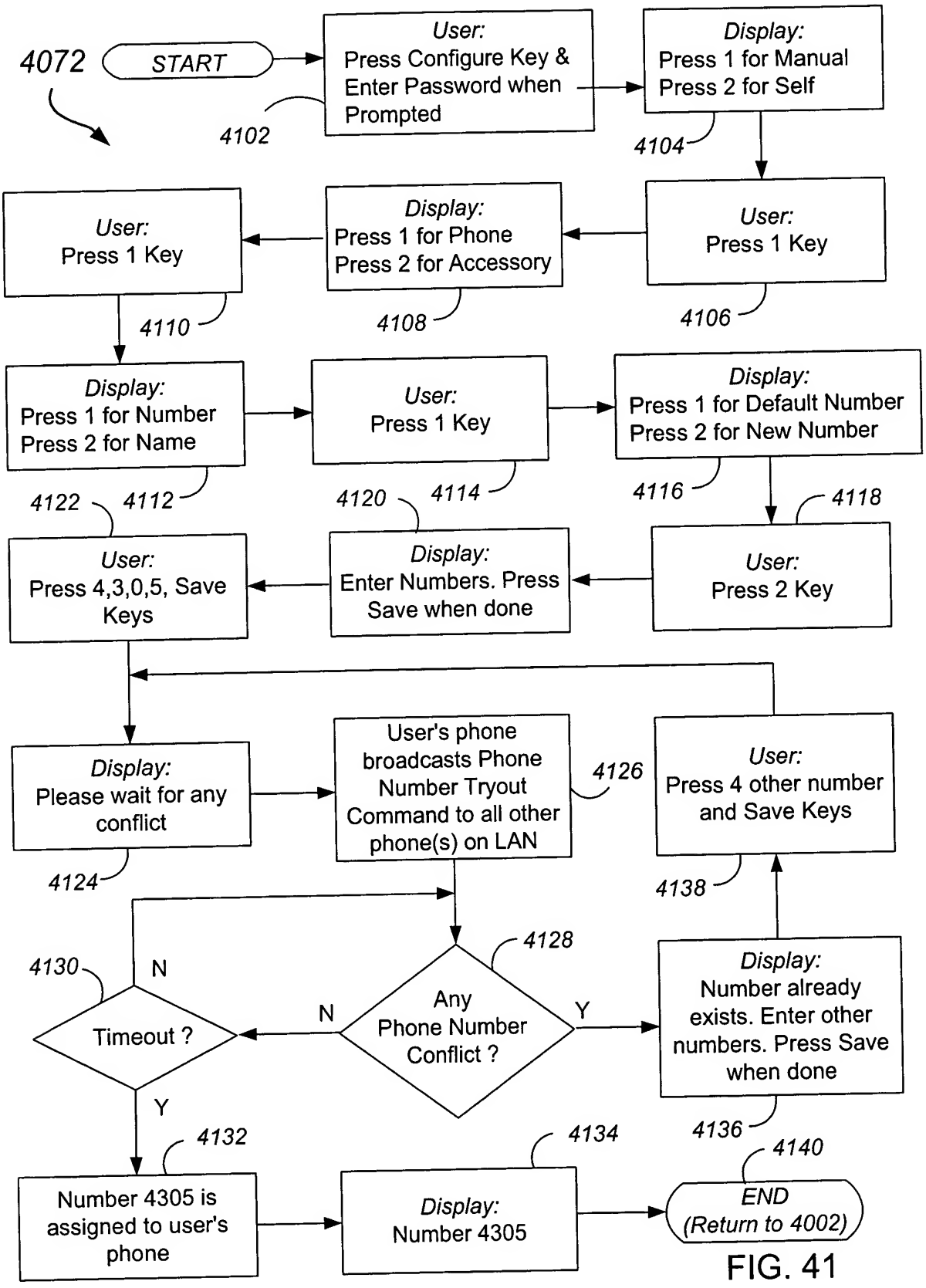

4072
START
User:
Press Configure Key & Enter Password when Prompted
4102
Display:
Press 1 for Manual
Press 2 for Self
4104
User:
Press 1 Key
4106
Display:
Press 1 for Phone
Press 2 for Accessory
4108
User:
Press 1 Key
4110
Display:
Press 1 for Number
Press 2 for Name
4112
User:
Press 1 Key
4114
Display:
Press 1 for Default Number
Press 2 for New Number
4116
4118
User:
Press 2 Key
Display:
Enter Numbers. Press Save when done
4120
User:
Press 4,3,0,5, Save Keys
4122
Display:
Please wait for any conflict
4124
User's phone broadcasts Phone Number Tryout Command to all other phone(s) on LAN
4126
User:
Press 4 other number and Save Keys
4138
4128
Any Phone Number Conflict ?
N
Y
4130
Timeout ?
N
Y
Display:
Number already exists. Enter other numbers. Press Save when done
4136
4132
Number 4305 is assigned to user's phone
4134
Display:
Number 4305
4140
END
(Return to 4002)

FIG. 41

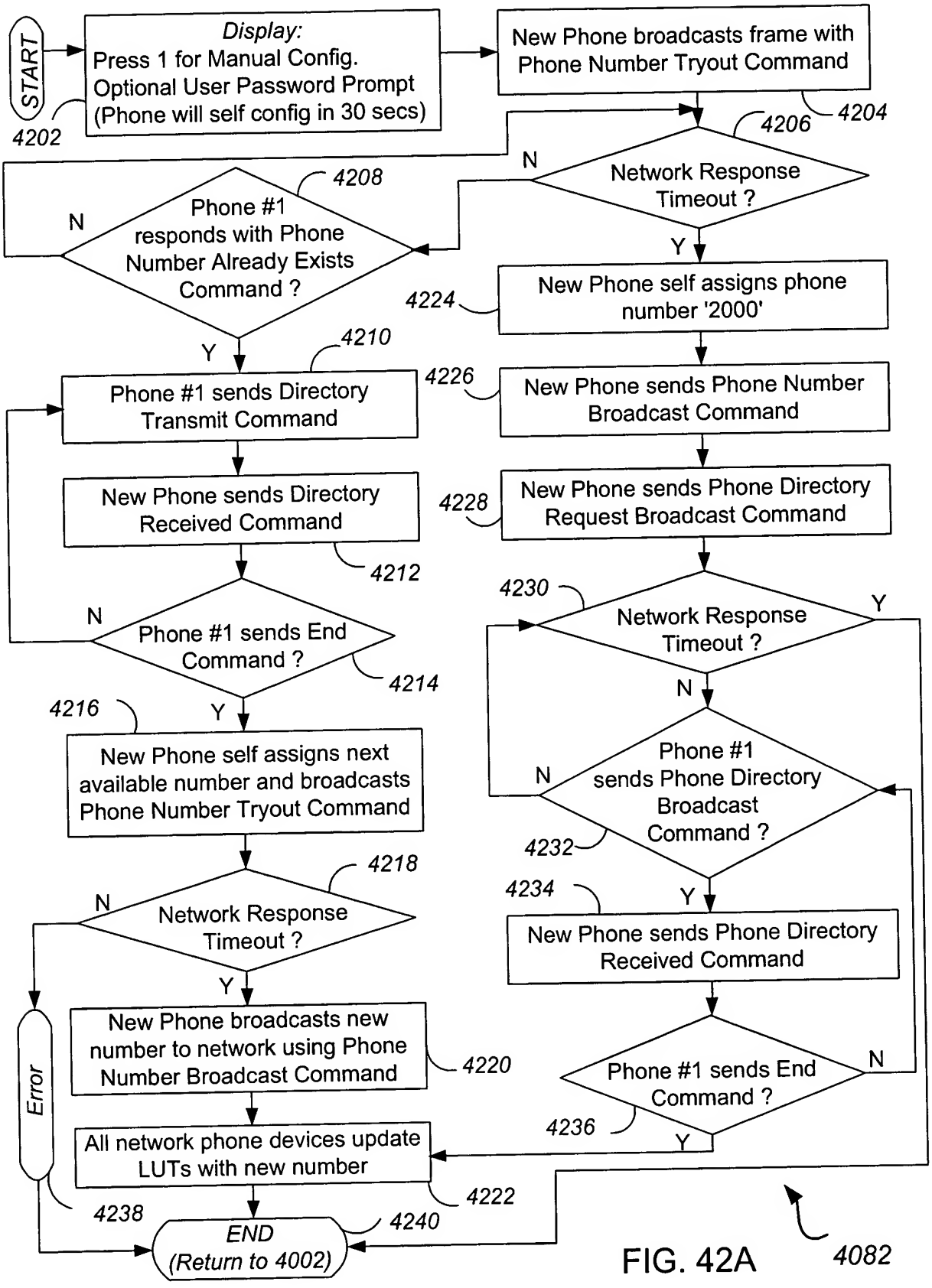

START
Display:
Press 1 for Manual Config.
Optional User Password Prompt
(Phone will self config in 30 secs)
4202
New Phone broadcasts frame with Phone Number Tryout Command
4204
4206
Network Response Timeout ?
N
Y
4208
Phone #1 responds with Phone Number Already Exists Command ?
N
Y
4224
New Phone self assigns phone number '2000'
4210
Phone #1 sends Directory Transmit Command
4226
New Phone sends Phone Number Broadcast Command
New Phone sends Directory Received Command
4228
New Phone sends Phone Directory Request Broadcast Command
4212
4230
Network Response Timeout ?
Y
N
Phone #1 sends End Command ?
N
Y
4214
4216
Phone #1 sends Phone Directory Broadcast Command ?
N
4232
New Phone self assigns next available number and broadcasts Phone Number Tryout Command
4234
Y
4218
Network Response Timeout ?
N
New Phone sends Phone Directory Received Command
Y
Error
New Phone broadcasts new number to network using Phone Number Broadcast Command
4220
Phone #1 sends End Command ?
N
4236
Y
All network phone devices update LUTs with new number
4222
4238
END
(Return to 4002)
4240
4082

FIG. 42A

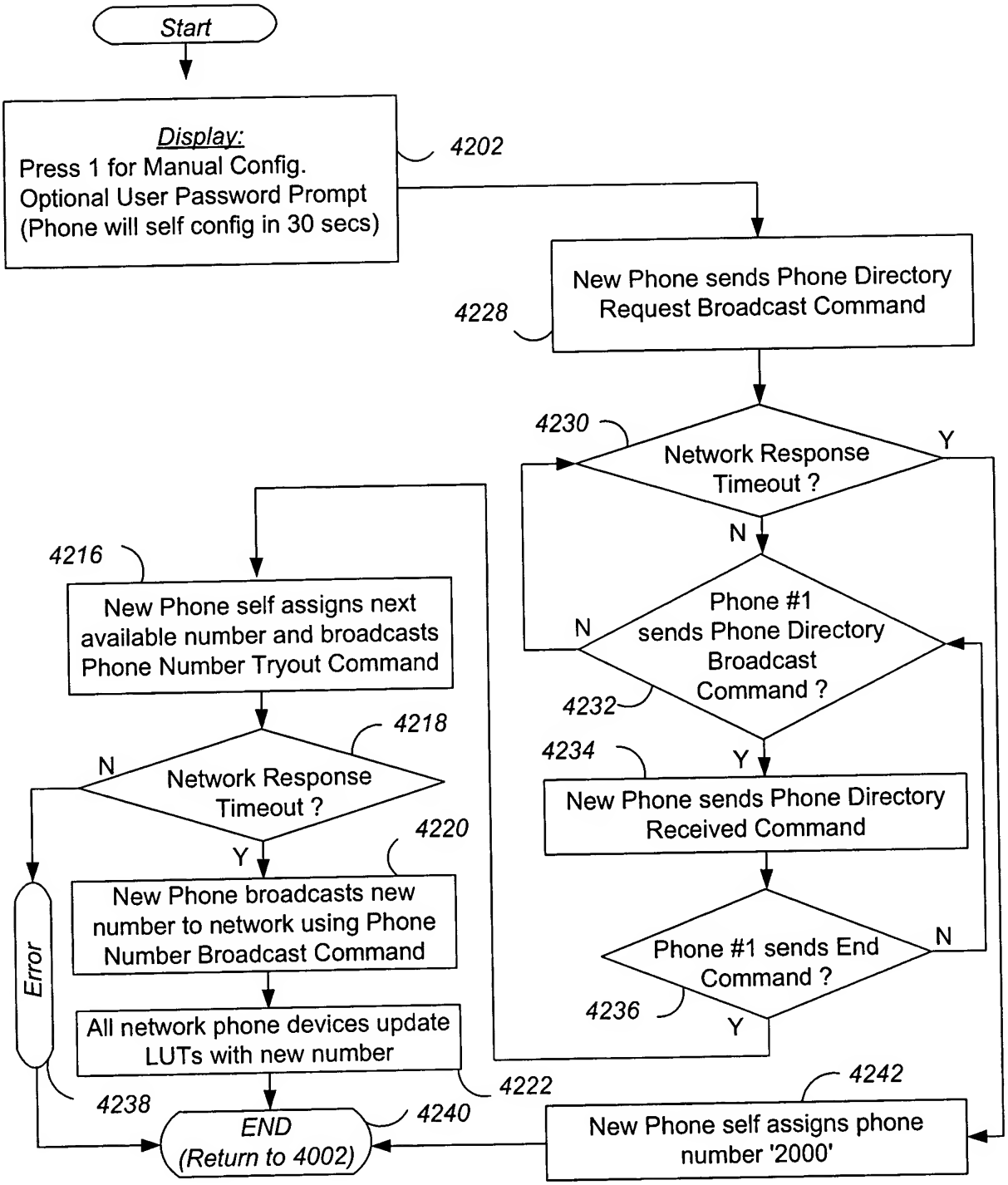

Start
Display:
Press 1 for Manual Config.
Optional User Password Prompt
(Phone will self config in 30 secs)
4202
New Phone sends Phone Directory Request Broadcast Command
4228
4230
Network Response Timeout ?
Y
N
Phone #1 sends Phone Directory Broadcast Command ?
N
4232
Y
4234
New Phone sends Phone Directory Received Command
Phone #1 sends End Command ?
N
4236
Y
4216
New Phone self assigns next available number and broadcasts Phone Number Tryout Command
4218
Network Response Timeout ?
N
Y
4220
New Phone broadcasts new number to network using Phone Number Broadcast Command
All network phone devices update LUTs with new number
4222
Error
4238
END
(Return to 4002)
4240
4242
New Phone self assigns phone number '2000'

FIG. 42B

4082

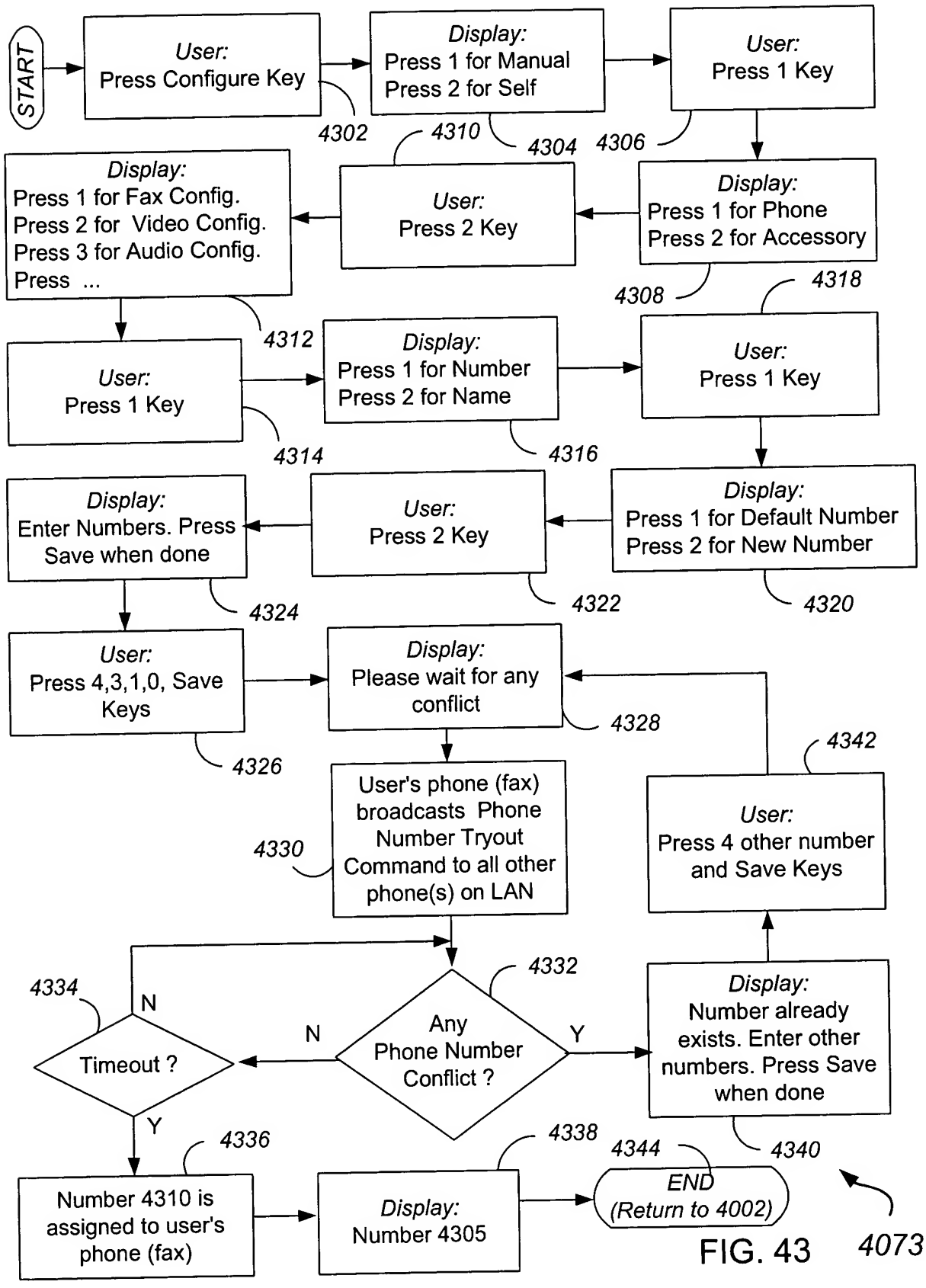

START
User:
Press Configure Key
4302
Display:
Press 1 for Manual
Press 2 for Self
4304
User:
Press 1 Key
4306
Display:
Press 1 for Phone
Press 2 for Accessory
4308
User:
Press 2 Key
4310
Display:
Press 1 for Fax Config.
Press 2 for Video Config.
Press 3 for Audio Config.
Press ...
4312
User:
Press 1 Key
4314
Display:
Press 1 for Number
Press 2 for Name
4316
User:
Press 1 Key
4318
Display:
Press 1 for Default Number
Press 2 for New Number
4320
User:
Press 2 Key
4322
Display:
Enter Numbers. Press
Save when done
4324
User:
Press 4,3,1,0, Save
Keys
4326
Display:
Please wait for any
conflict
4328
User's phone (fax)
broadcasts Phone
Number Tryout
Command to all other
phone(s) on LAN
4330
Any
Phone Number
Conflict ?
4332
N
Y
Timeout ?
4334
N
Y
Number 4310 is
assigned to user's
phone (fax)
4336
Display:
Number 4305
4338
Display:
Number already
exists. Enter other
numbers. Press Save
when done
4340
User:
Press 4 other number
and Save Keys
4342
END
(Return to 4002)
4344
4073

FIG. 43

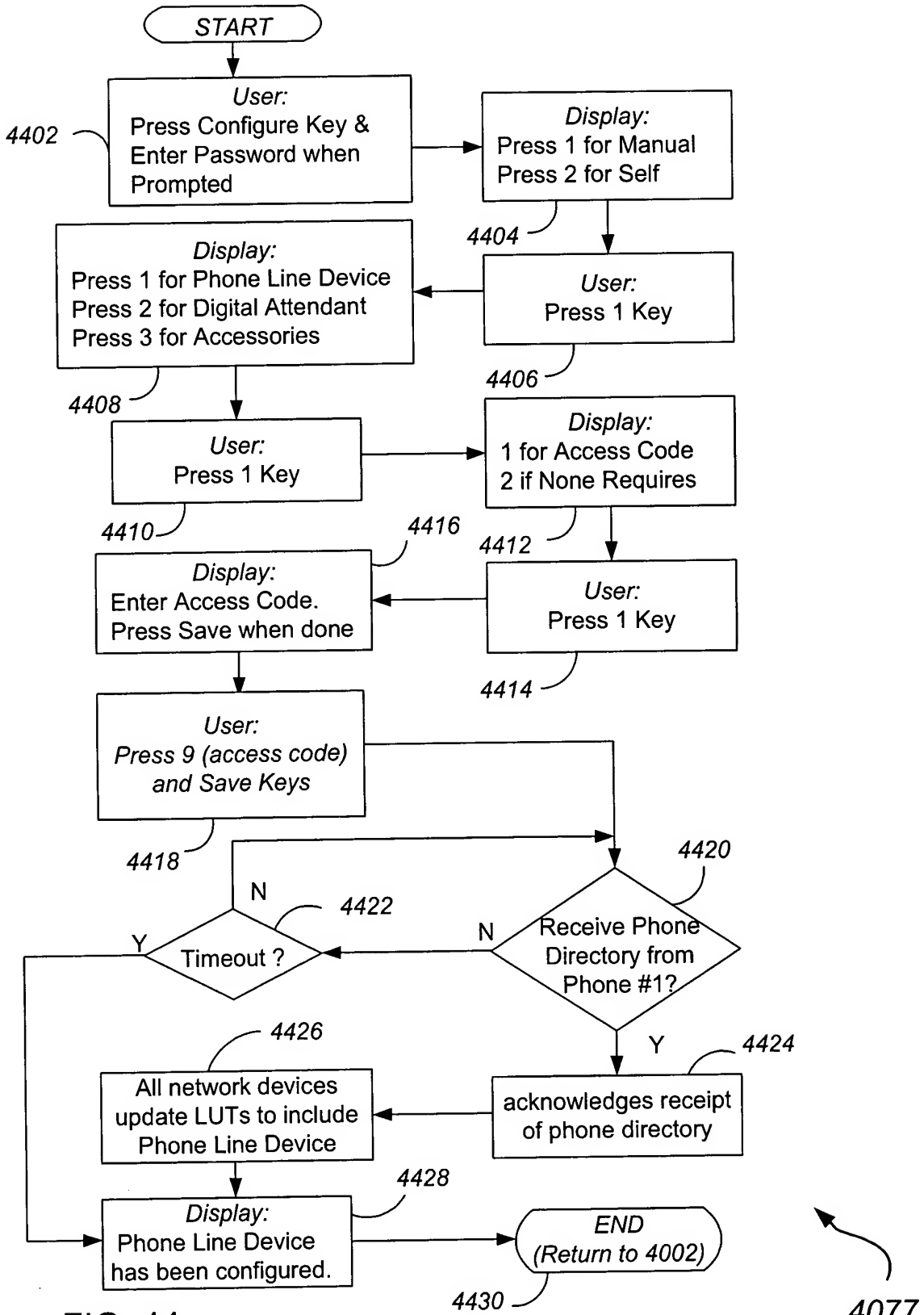

START
User:
Press Configure Key &
Enter Password when
Prompted
4402
Display:
Press 1 for Manual
Press 2 for Self
4404
User:
Press 1 Key
4406
Display:
Press 1 for Phone Line Device
Press 2 for Digital Attendant
Press 3 for Accessories
4408
User:
Press 1 Key
4410
Display:
1 for Access Code
2 if None Requires
4412
Display:
Enter Access Code.
Press Save when done
4416
User:
Press 1 Key
4414
User:
Press 9 (access code)
and Save Keys
4418
4420
Receive Phone
Directory from
Phone #1?
N
Y
Timeout ?
4422
N
Y
4424
acknowledges receipt
of phone directory
All network devices
update LUTs to include
Phone Line Device
4426
Display:
Phone Line Device
has been configured.
4428
END
(Return to 4002)
4430
4077

FIG. 44

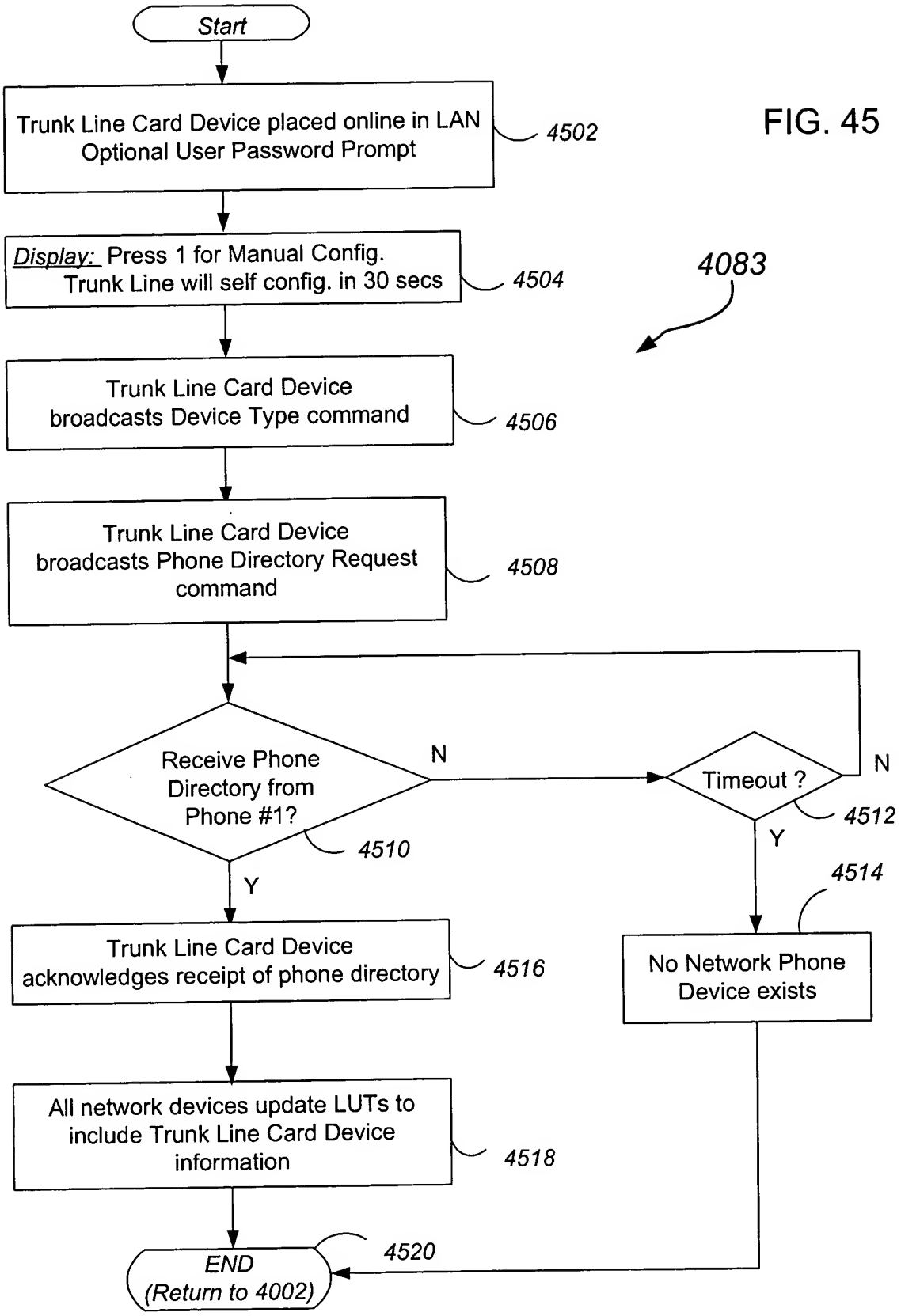
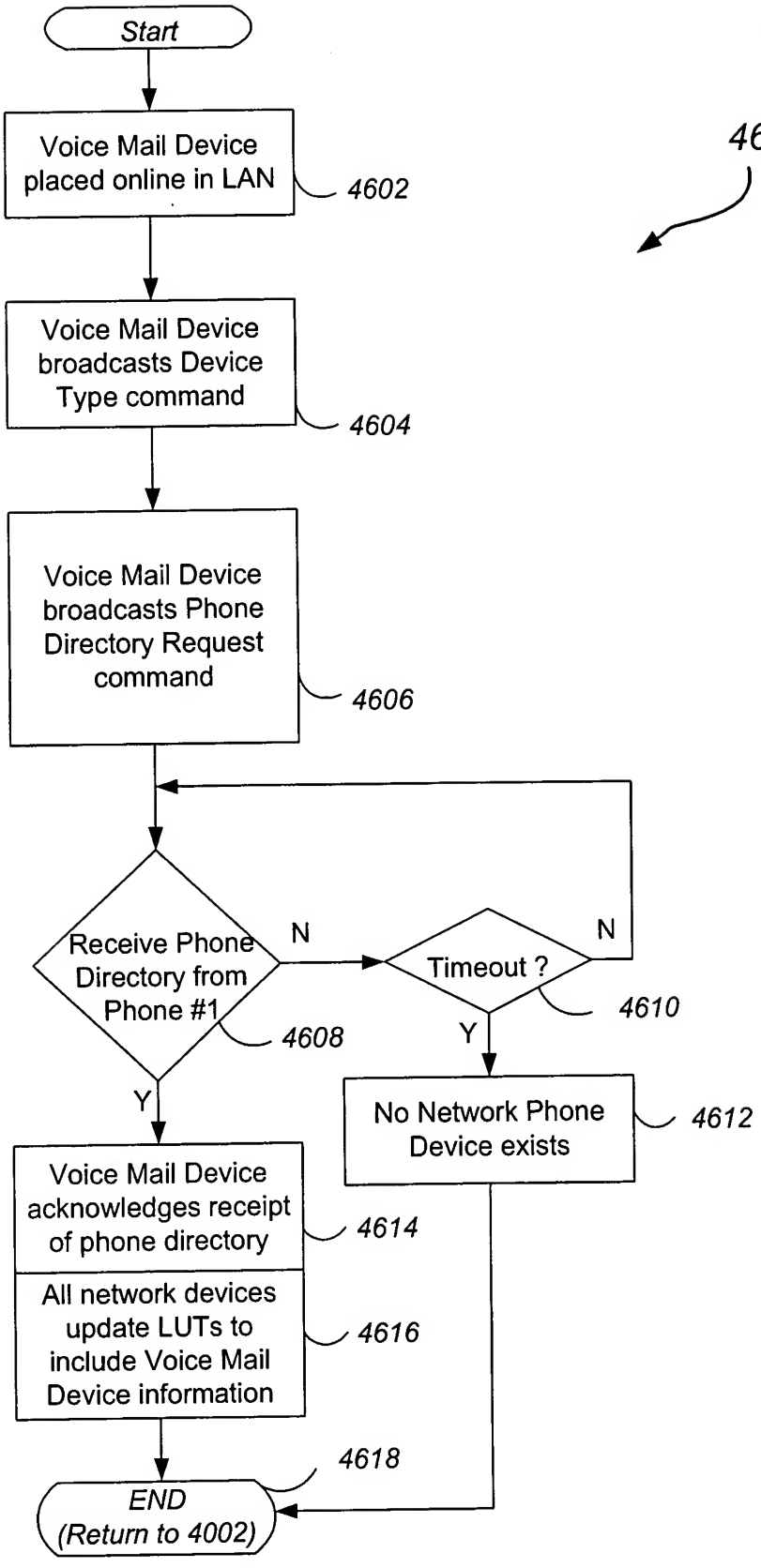

Start
Trunk Line Card Device placed online in LAN
Optional User Password Prompt
4502
Display: Press 1 for Manual Config.
Trunk Line will self config. in 30 secs
4504
4083
Trunk Line Card Device
broadcasts Device Type command
4506
Trunk Line Card Device
broadcasts Phone Directory Request
command
4508
Receive Phone
Directory from
Phone #1?
4510
N
Y
Timeout ?
4512
N
Y
4514
Trunk Line Card Device
acknowledges receipt of phone directory
4516
No Network Phone
Device exists
All network devices update LUTs to
include Trunk Line Card Device
information
4518
END
(Return to 4002)
4520

FIG. 45

FIG. 46


Start
Voice Mail Device placed online in LAN
4602
4600
Voice Mail Device broadcasts Device Type command
4604
Voice Mail Device broadcasts Phone Directory Request command
4606
Receive Phone Directory from Phone #1
4608
N
Timeout ?
4610
N
Y
Y
No Network Phone Device exists
4612
Voice Mail Device acknowledges receipt of phone directory
4614
All network devices update LUTs to include Voice Mail Device information
4616
4618
END
(Return to 4002)

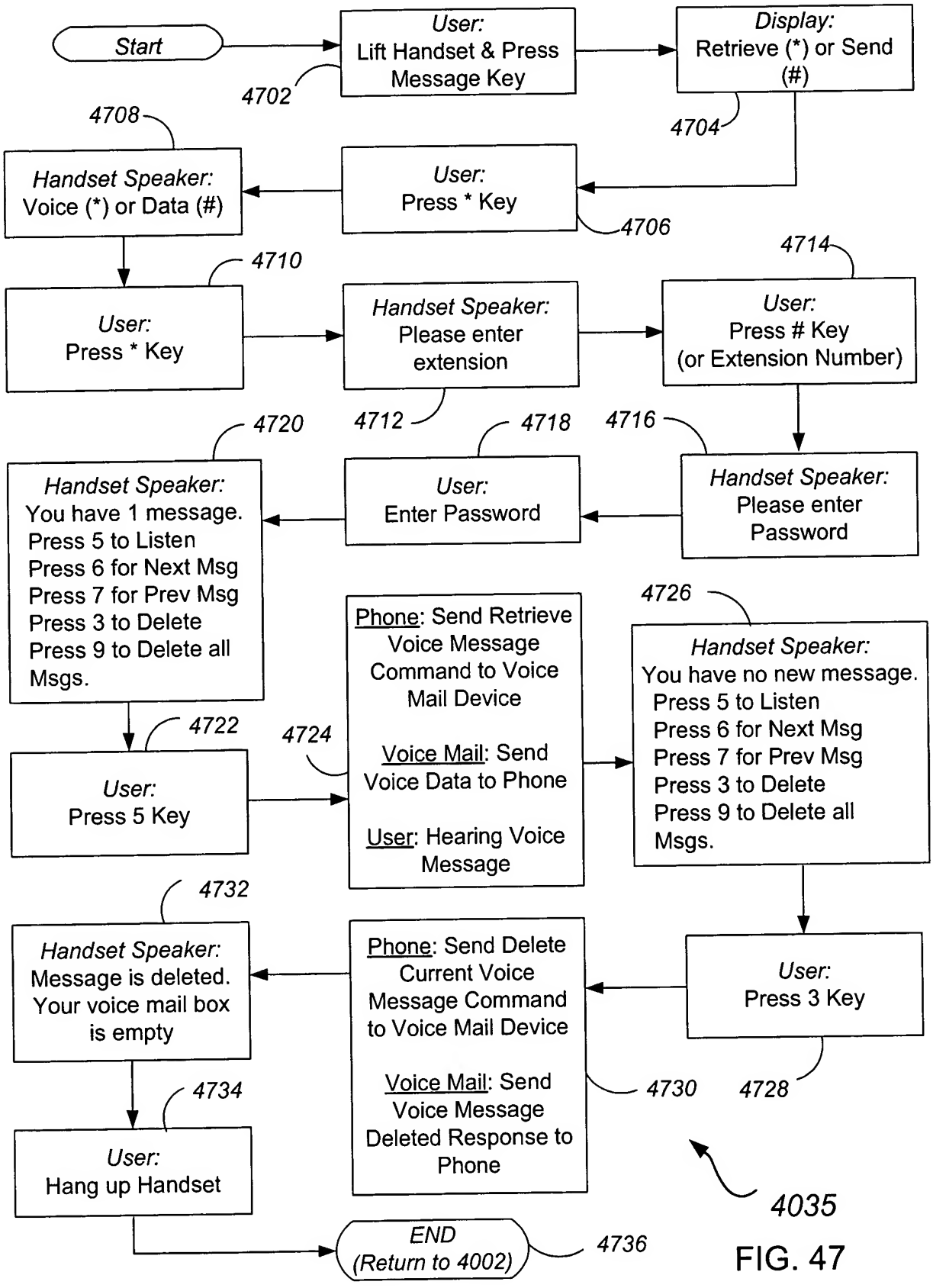

Start
User: Lift Handset & Press Message Key
4702
Display: Retrieve (*) or Send (#)
4704
User: Press * Key
4706
Handset Speaker: Voice (*) or Data (#)
4708
User: Press * Key
4710
Handset Speaker: Please enter extension
4712
User: Press # Key (or Extension Number)
4714
Handset Speaker: Please enter Password
4716
User: Enter Password
4718
Handset Speaker: You have 1 message. Press 5 to Listen Press 6 for Next Msg Press 7 for Prev Msg Press 3 to Delete Press 9 to Delete all Msgs.
4720
User: Press 5 Key
4722
Phone: Send Retrieve Voice Message Command to Voice Mail Device
Voice Mail: Send Voice Data to Phone
User: Hearing Voice Message
4724
Handset Speaker: You have no new message. Press 5 to Listen Press 6 for Next Msg Press 7 for Prev Msg Press 3 to Delete Press 9 to Delete all Msgs.
4726
User: Press 3 Key
4728
Phone: Send Delete Current Voice Message Command to Voice Mail Device
Voice Mail: Send Voice Message Deleted Response to Phone
4730
Handset Speaker: Message is deleted. Your voice mail box is empty
4732
User: Hang up Handset
4734
END (Return to 4002)
4736
4035

FIG. 47

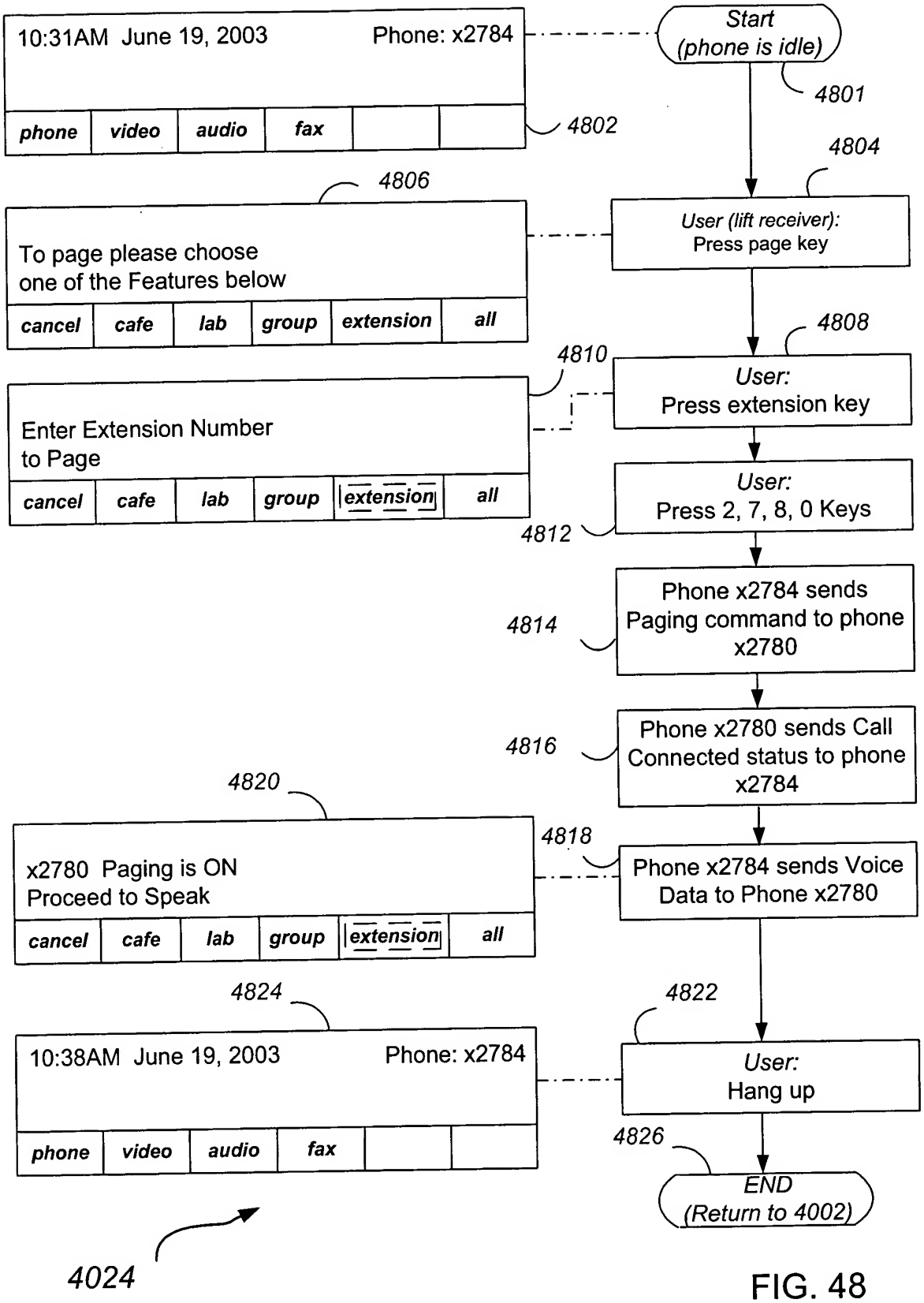

10:31AM June 19, 2003
Phone: x2784
phone
video
audio
fax
4802
Start
(phone is idle)
4801
4804
4806
To page please choose
one of the Features below
cancel
cafe
lab
group
extension
all
User (lift receiver):
Press page key
4808
4810
Enter Extension Number
to Page
User:
Press extension key
User:
Press 2, 7, 8, 0 Keys
4812
Phone x2784 sends
Paging command to phone
x2780
4814
Phone x2780 sends Call
Connected status to phone
x2784
4816
4820
x2780 Paging is ON
Proceed to Speak
4818
Phone x2784 sends Voice
Data to Phone x2780
4824
4822
10:38AM June 19, 2003
Phone: x2784
User:
Hang up
4826
END
(Return to 4002)
4024

FIG. 48

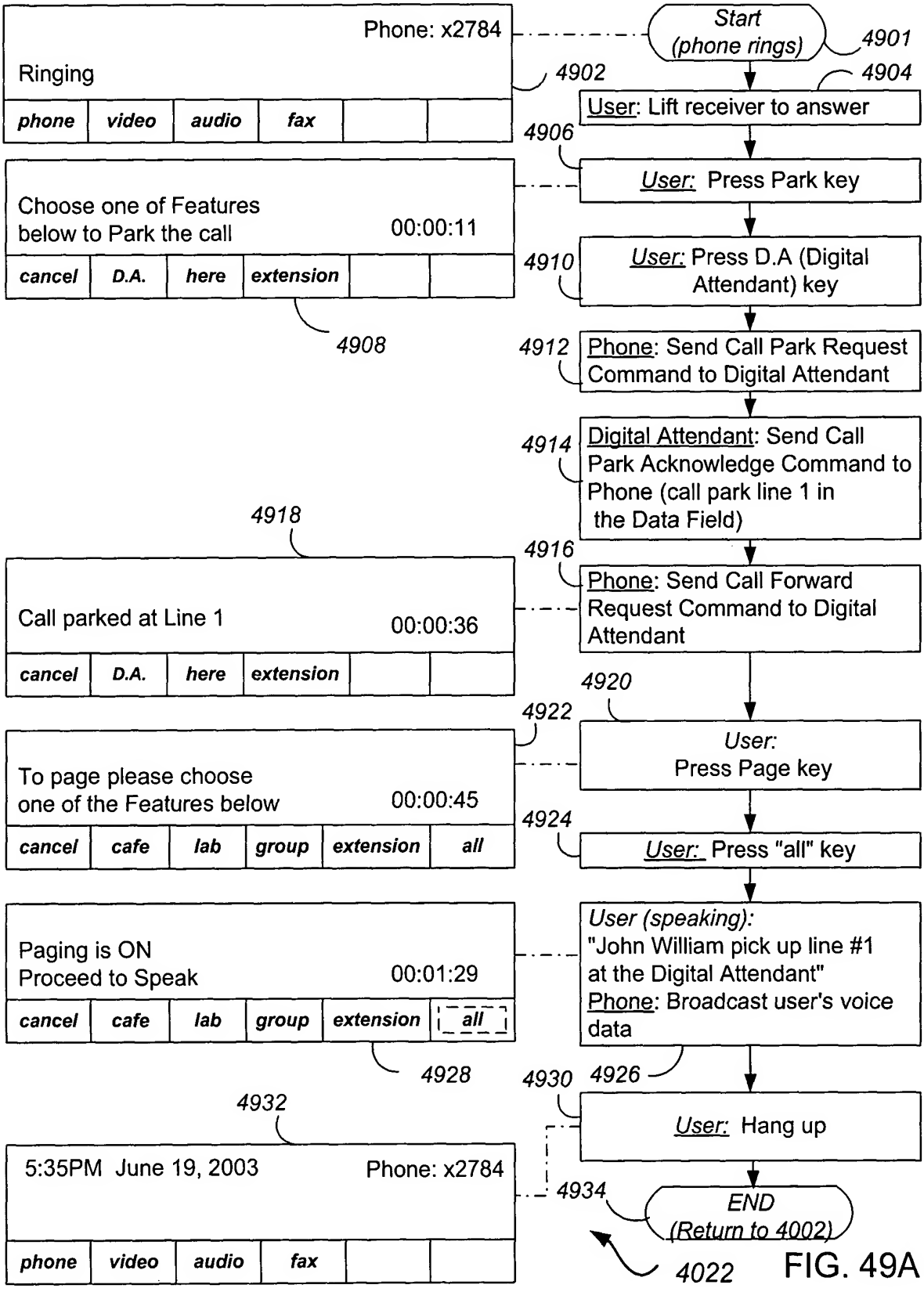

Phone: x2784
Ringing
phone
video
audio
fax
Start
(phone rings)
4901
4902
4904
User: Lift receiver to answer
4906
User: Press Park key
Choose one of Features
below to Park the call
00:00:11
cancel
D.A.
here
extension
4908
4910
User: Press D.A (Digital
Attendant) key
4912
Phone: Send Call Park Request
Command to Digital Attendant
4914
Digital Attendant: Send Call
Park Acknowledge Command to
Phone (call park line 1 in
the Data Field)
4918
4916
Call parked at Line 1
00:00:36
Phone: Send Call Forward
Request Command to Digital
Attendant
4920
4922
User:
Press Page key
To page please choose
one of the Features below
00:00:45
cafe
lab
group
all
4924
User: Press "all" key
Paging is ON
Proceed to Speak
00:01:29
User (speaking):
"John William pick up line #1
at the Digital Attendant"
Phone: Broadcast user's voice
data
4928
4930
4926
4932
User: Hang up
5:35PM June 19, 2003
4934
END
(Return to 4002)
4022

FIG. 49A

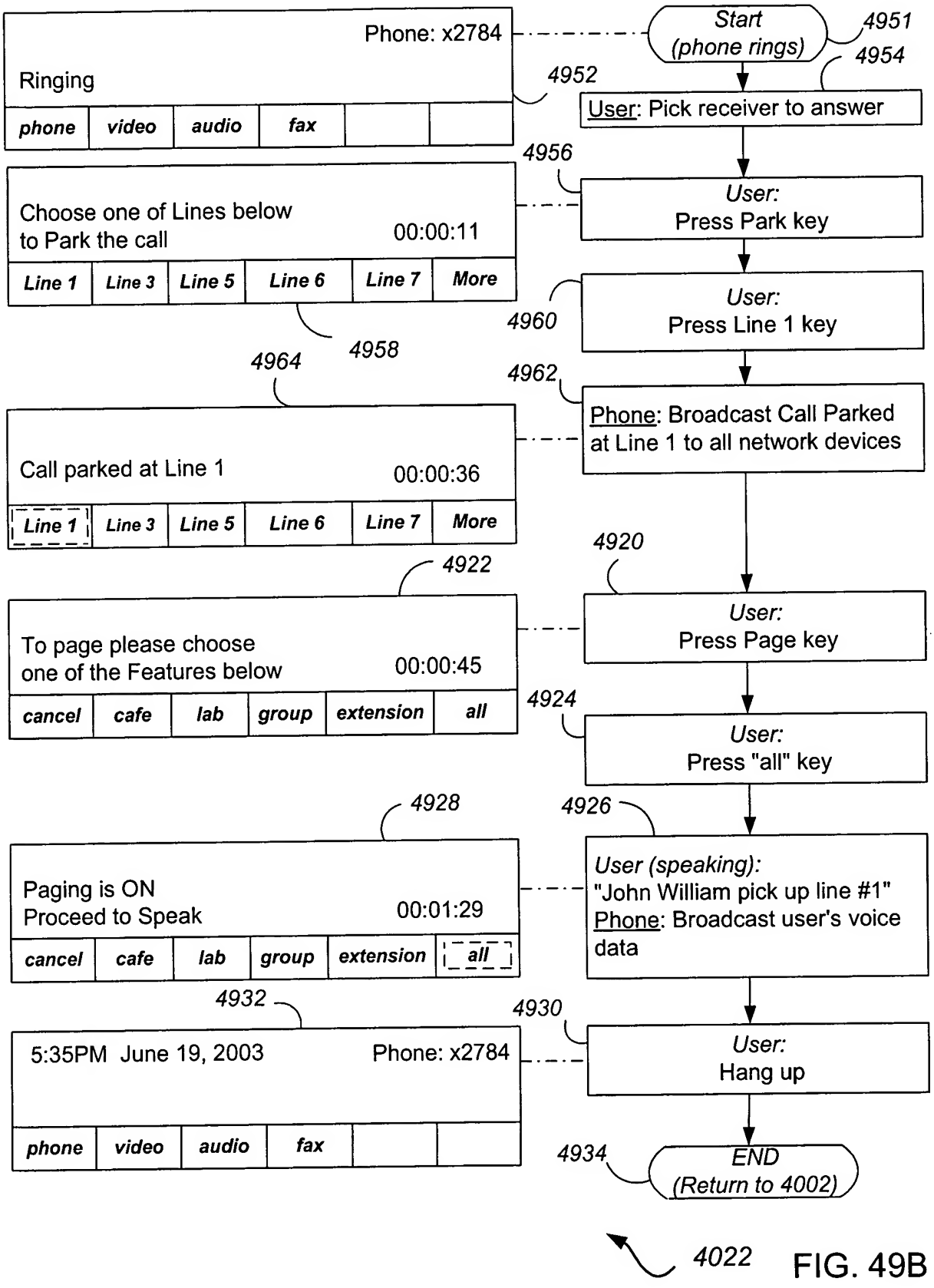

Start
(phone rings)
4951
4954
User: Pick receiver to answer
4952
Phone: x2784
Ringing
phone
video
audio
fax
4956
User:
Press Park key
Choose one of Lines below
to Park the call
00:00:11
Line 1
Line 3
Line 5
Line 6
Line 7
More
4960
User:
Press Line 1 key
4958
4964
4962
Phone: Broadcast Call Parked
at Line 1 to all network devices
Call parked at Line 1
00:00:36
Line 1
Line 3
Line 5
Line 6
Line 7
More
4920
4922
User:
Press Page key
To page please choose
one of the Features below
00:00:45
cancel
cafe
lab
group
extension
all
4924
User:
Press "all" key
4928
4926
Paging is ON
Proceed to Speak
00:01:29
cancel
cafe
lab
group
extension
all
User (speaking):
"John William pick up line #1"
Phone: Broadcast user's voice
data
4932
4930
5:35PM June 19, 2003
Phone: x2784
phone
video
audio
fax
User:
Hang up
4934
END
(Return to 4002)
4022

FIG. 49B

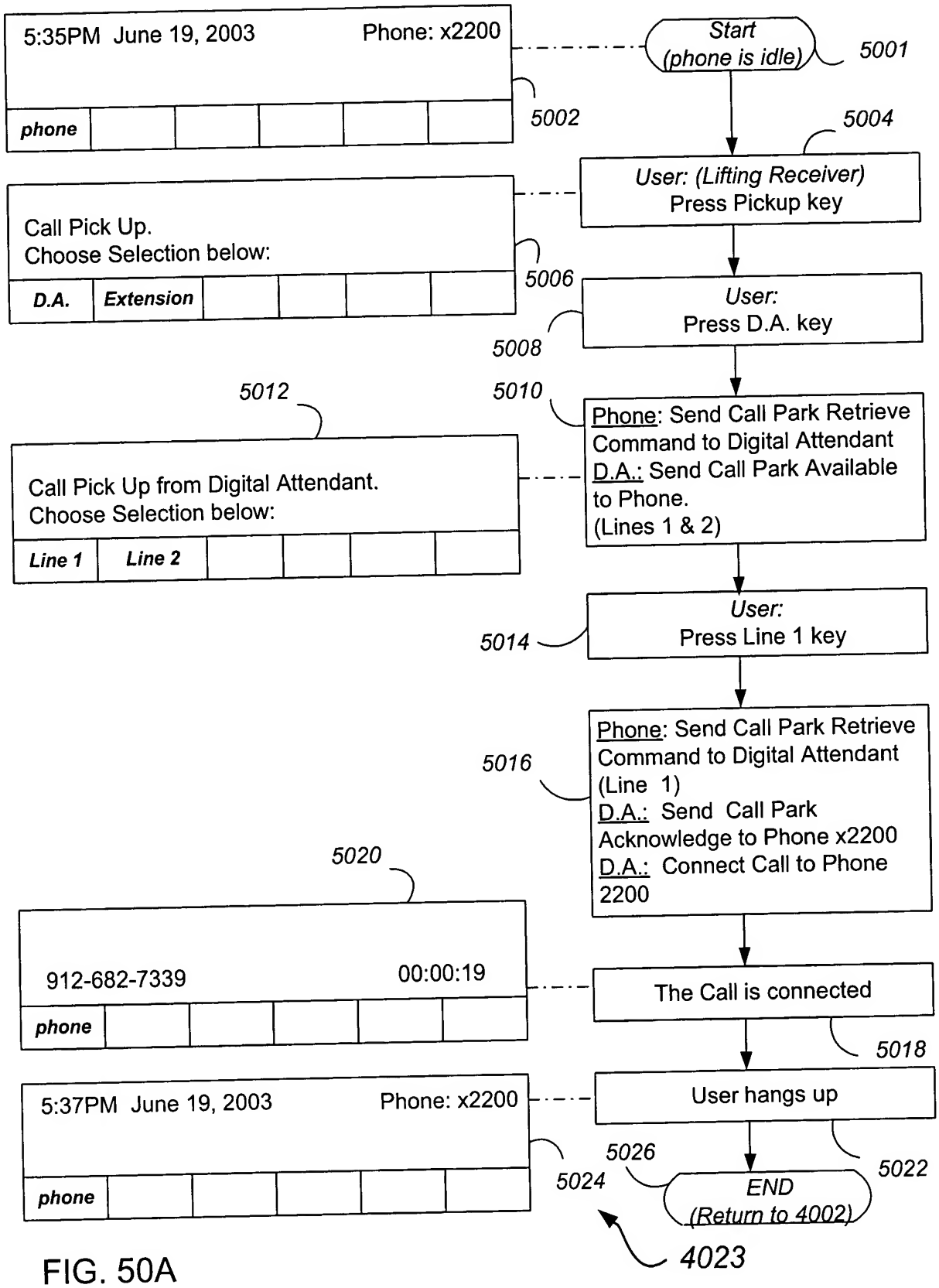

5:35PM June 19, 2003
Phone: x2200
phone
5002
Start
(phone is idle)
5001
5004
User: (Lifting Receiver)
Press Pickup key
Call Pick Up.
Choose Selection below:
D.A.
Extension
5006
User:
Press D.A. key
5008
5012
5010
Phone: Send Call Park Retrieve Command to Digital Attendant
D.A.: Send Call Park Available to Phone.
(Lines 1 & 2)
Call Pick Up from Digital Attendant.
Choose Selection below:
Line 1
Line 2
User:
Press Line 1 key
5014
Phone: Send Call Park Retrieve Command to Digital Attendant (Line 1)
D.A.: Send Call Park Acknowledge to Phone x2200
D.A.: Connect Call to Phone 2200
5016
5020
912-682-7339
00:00:19
phone
The Call is connected
5018
5:37PM June 19, 2003
Phone: x2200
phone
User hangs up
5026
5022
5024
END
(Return to 4002)
4023

FIG. 50A

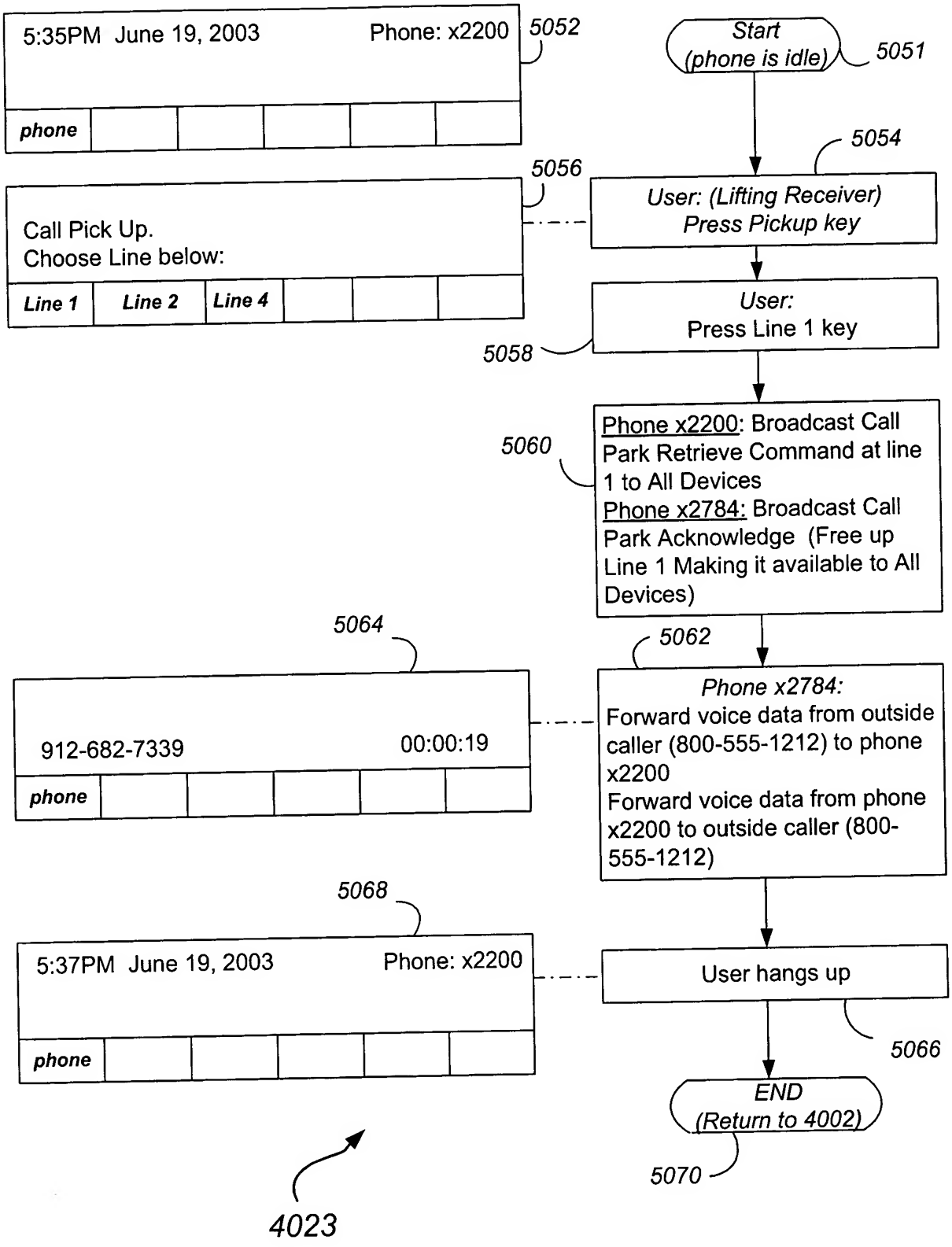

5:35PM June 19, 2003
Phone: x2200
5052
phone
Start
(phone is idle)
5051
5054
User: (Lifting Receiver)
Press Pickup key
5056
Call Pick Up.
Choose Line below:
Line 1
Line 2
Line 4
User:
Press Line 1 key
5058
5060
Phone x2200: Broadcast Call Park Retrieve Command at line 1 to All Devices
Phone x2784: Broadcast Call Park Acknowledge (Free up Line 1 Making it available to All Devices)
5064
5062
912-682-7339
00:00:19
phone
Phone x2784:
Forward voice data from outside caller (800-555-1212) to phone x2200
Forward voice data from phone x2200 to outside caller (800-555-1212)
5068
5:37PM June 19, 2003
Phone: x2200
phone
User hangs up
5066
END
(Return to 4002)
5070
4023

FIG. 50B

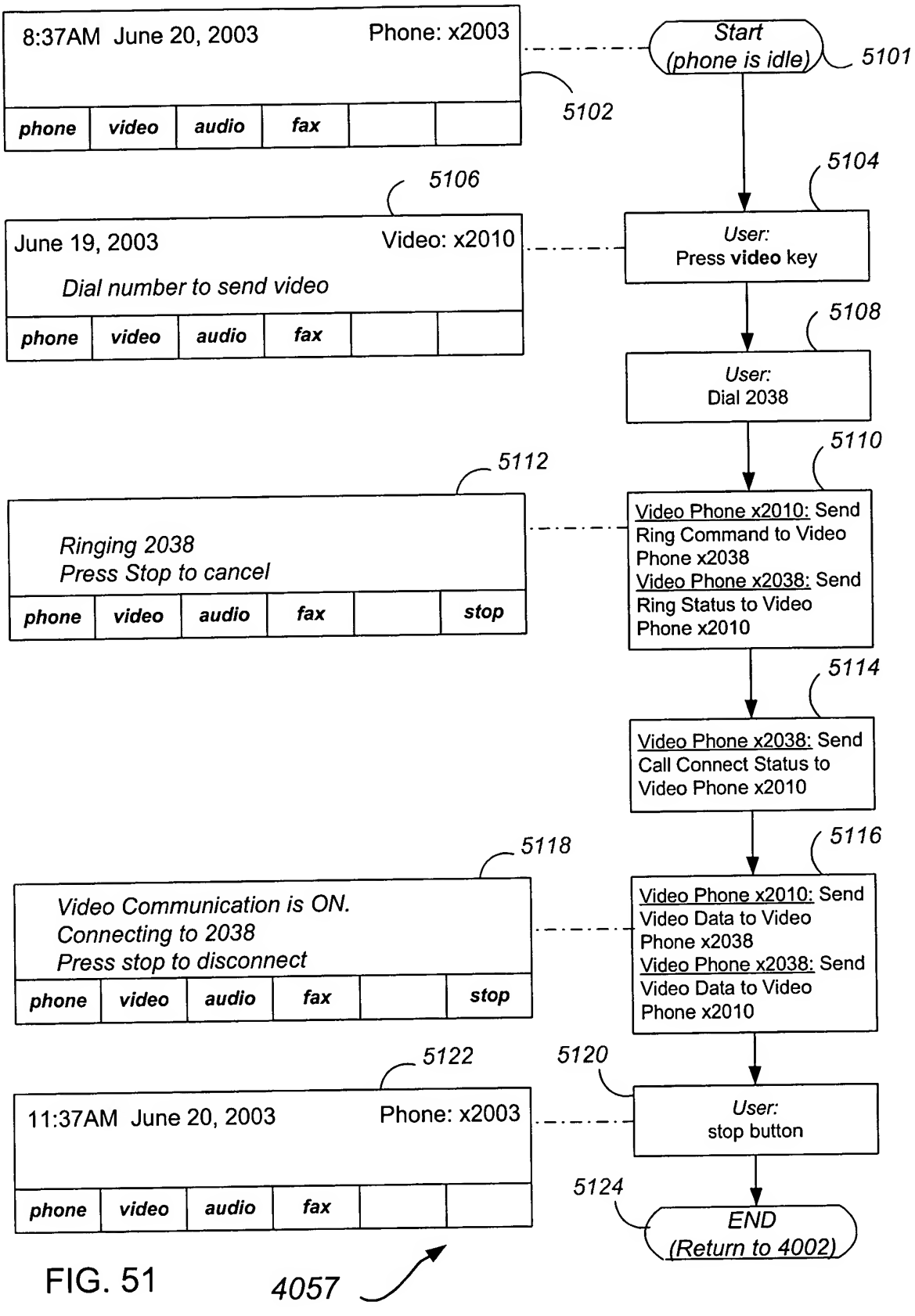
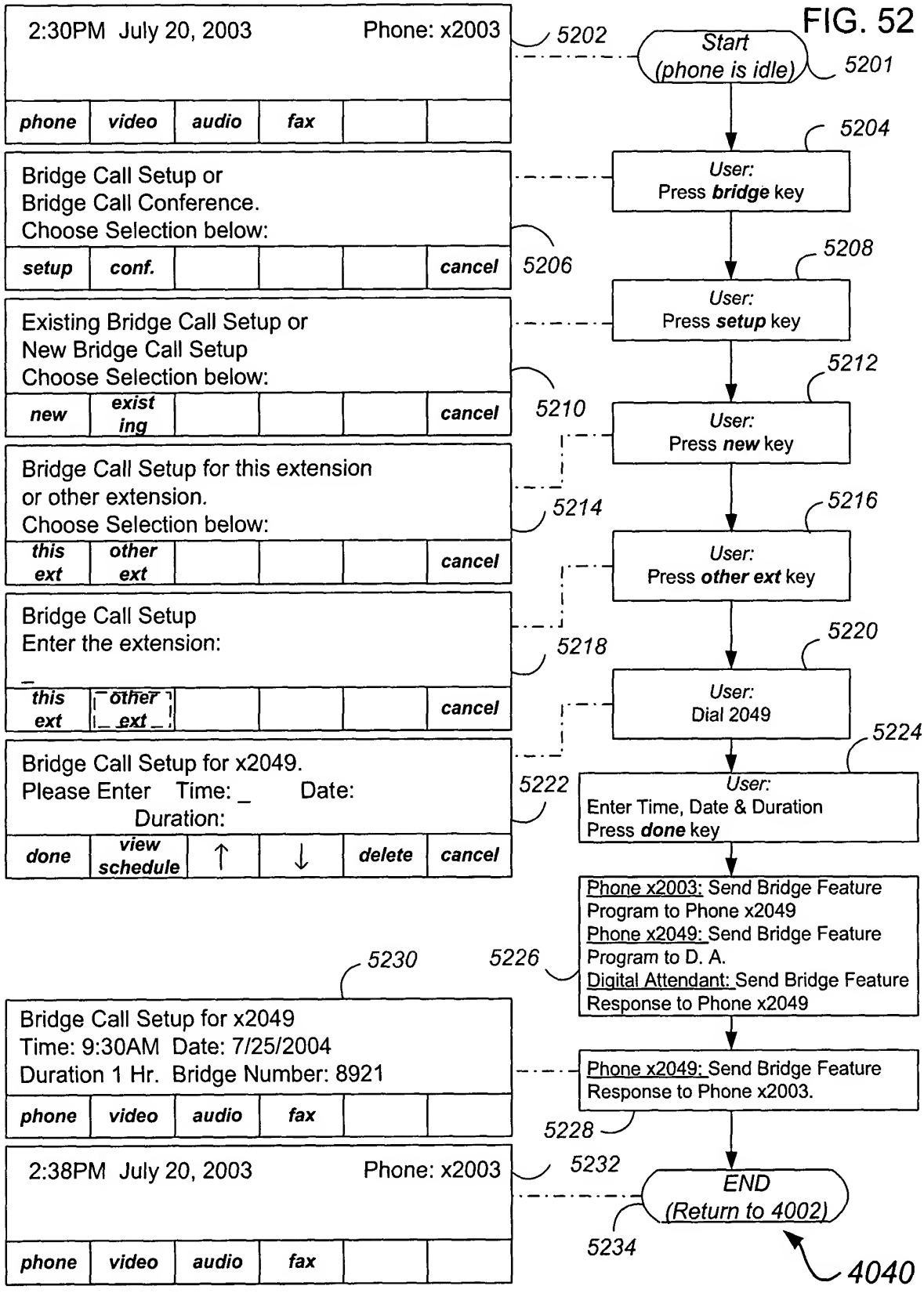

8:37AM June 20, 2003
Phone: x2003
phone
video
audio
fax
5102
Start
(phone is idle)
5101
5104
User:
Press video key
5106
June 19, 2003
Video: x2010
Dial number to send video
5108
User:
Dial 2038
5110
Video Phone x2010: Send Ring Command to Video Phone x2038
Video Phone x2038: Send Ring Status to Video Phone x2010
5112
Ringing 2038
Press Stop to cancel
stop
5114
Video Phone x2038: Send Call Connect Status to Video Phone x2010
5116
Video Phone x2010: Send Video Data to Video Phone x2038
Video Phone x2038: Send Video Data to Video Phone x2010
5118
Video Communication is ON.
Connecting to 2038
Press stop to disconnect
5120
User:
stop button
5122
11:37AM June 20, 2003
Phone: x2003
5124
END
(Return to 4002)

FIG. 51

4057

FIG. 52


2:30PM July 20, 2003
Phone: x2003
phone
video
audio
fax
5202
Start
(phone is idle)
5201
5204
User:
Press bridge key
Bridge Call Setup or
Bridge Call Conference.
Choose Selection below:
setup
conf.
cancel
5206
5208
User:
Press setup key
Existing Bridge Call Setup or
New Bridge Call Setup
Choose Selection below:
new
existing
cancel
5210
5212
User:
Press new key
Bridge Call Setup for this extension
or other extension.
Choose Selection below:
this ext
other ext
cancel
5214
5216
User:
Press other ext key
Bridge Call Setup
Enter the extension:
_
this ext
other ext
cancel
5218
5220
User:
Dial 2049
Bridge Call Setup for x2049.
Please Enter Time: _ Date:
Duration:
done
view schedule
↑
↓
delete
cancel
5222
5224
User:
Enter Time, Date & Duration
Press done key
Phone x2003: Send Bridge Feature
Program to Phone x2049
Phone x2049: Send Bridge Feature
Program to D. A.
Digital Attendant: Send Bridge Feature
Response to Phone x2049
5226
5230
Bridge Call Setup for x2049
Time: 9:30AM Date: 7/25/2004
Duration 1 Hr. Bridge Number: 8921
phone
video
audio
fax
Phone x2049: Send Bridge Feature
Response to Phone x2003.
5228
2:38PM July 20, 2003
Phone: x2003
phone
video
audio
fax
5232
END
(Return to 4002)
5234
4040

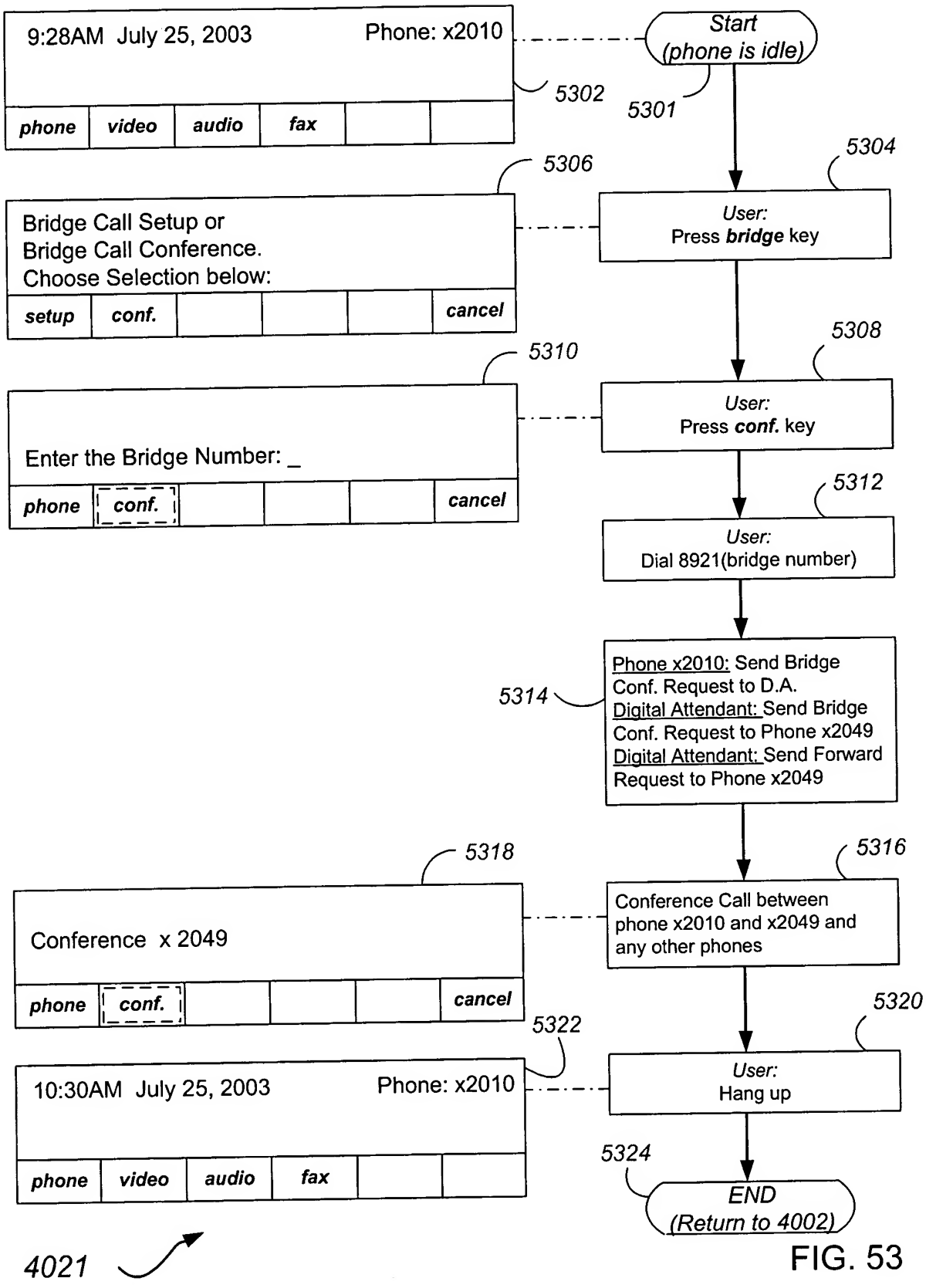

9:28AM July 25, 2003
Phone: x2010
phone
video
audio
fax
5302
Start
(phone is idle)
5301
5304
User:
Press bridge key
5306
Bridge Call Setup or
Bridge Call Conference.
Choose Selection below:
setup
conf.
cancel
5308
User:
Press conf. key
5310
Enter the Bridge Number: _
phone
conf.
cancel
5312
User:
Dial 8921(bridge number)
5314
Phone x2010: Send Bridge Conf. Request to D.A.
Digital Attendant: Send Bridge Conf. Request to Phone x2049
Digital Attendant: Send Forward Request to Phone x2049
5316
Conference Call between phone x2010 and x2049 and any other phones
5318
Conference x 2049
phone
conf.
cancel
5320
User:
Hang up
5322
10:30AM July 25, 2003
Phone: x2010
phone
video
audio
fax
5324
END
(Return to 4002)
4021

FIG. 53

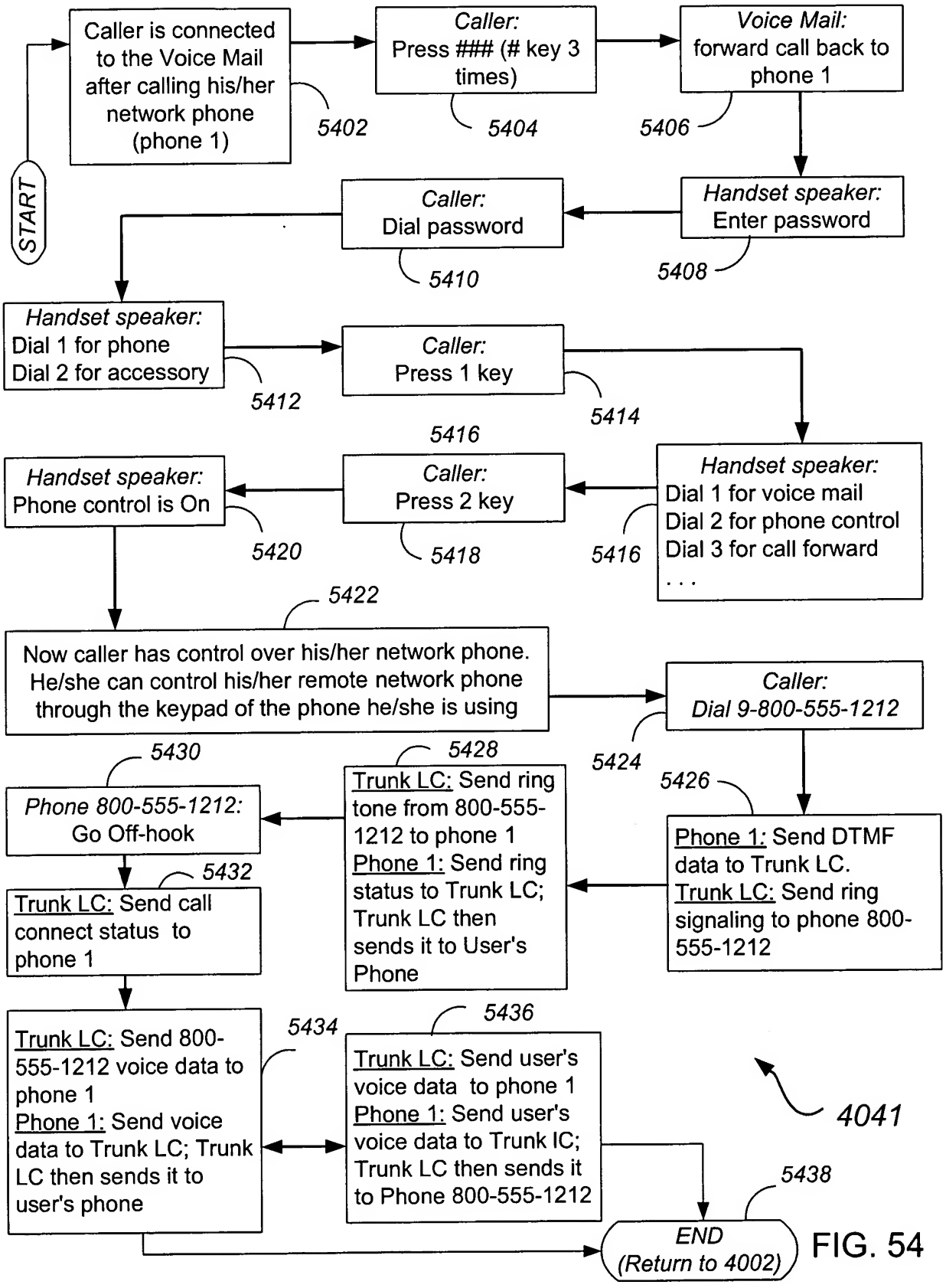
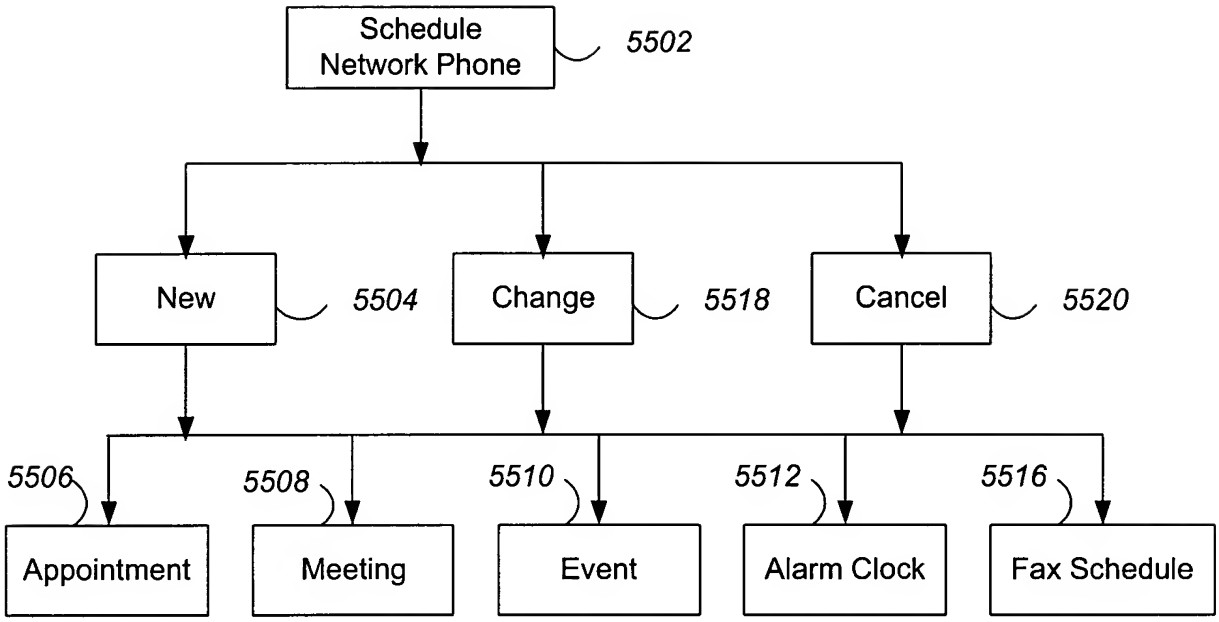

START
Caller is connected to the Voice Mail after calling his/her network phone (phone 1)
5402
Caller: Press ### (# key 3 times)
5404
Voice Mail: forward call back to phone 1
5406
Handset speaker: Enter password
5408
Caller: Dial password
5410
Handset speaker: Dial 1 for phone Dial 2 for accessory
5412
Caller: Press 1 key
5414
5416
Handset speaker: Dial 1 for voice mail Dial 2 for phone control Dial 3 for call forward . . .
5416
Caller: Press 2 key
5418
Handset speaker: Phone control is On
5420
5422
Now caller has control over his/her network phone. He/she can control his/her remote network phone through the keypad of the phone he/she is using
Caller: Dial 9-800-555-1212
5424
5426
Phone 1: Send DTMF data to Trunk LC. Trunk LC: Send ring signaling to phone 800-555-1212
5428
Trunk LC: Send ring tone from 800-555-1212 to phone 1 Phone 1: Send ring status to Trunk LC; Trunk LC then sends it to User's Phone
5430
Phone 800-555-1212: Go Off-hook
5432
Trunk LC: Send call connect status to phone 1
5434
Trunk LC: Send 800-555-1212 voice data to phone 1 Phone 1: Send voice data to Trunk LC; Trunk LC then sends it to user's phone
5436
Trunk LC: Send user's voice data to phone 1 Phone 1: Send user's voice data to Trunk IC; Trunk LC then sends it to Phone 800-555-1212
4041
5438
END (Return to 4002)

FIG. 54


Schedule Network Phone
5502
New
5504
Change
5518
Cancel
5520
5506
5508
5510
5512
5516
Appointment
Meeting
Event
Alarm Clock
Fax Schedule

4050

FIG. 55

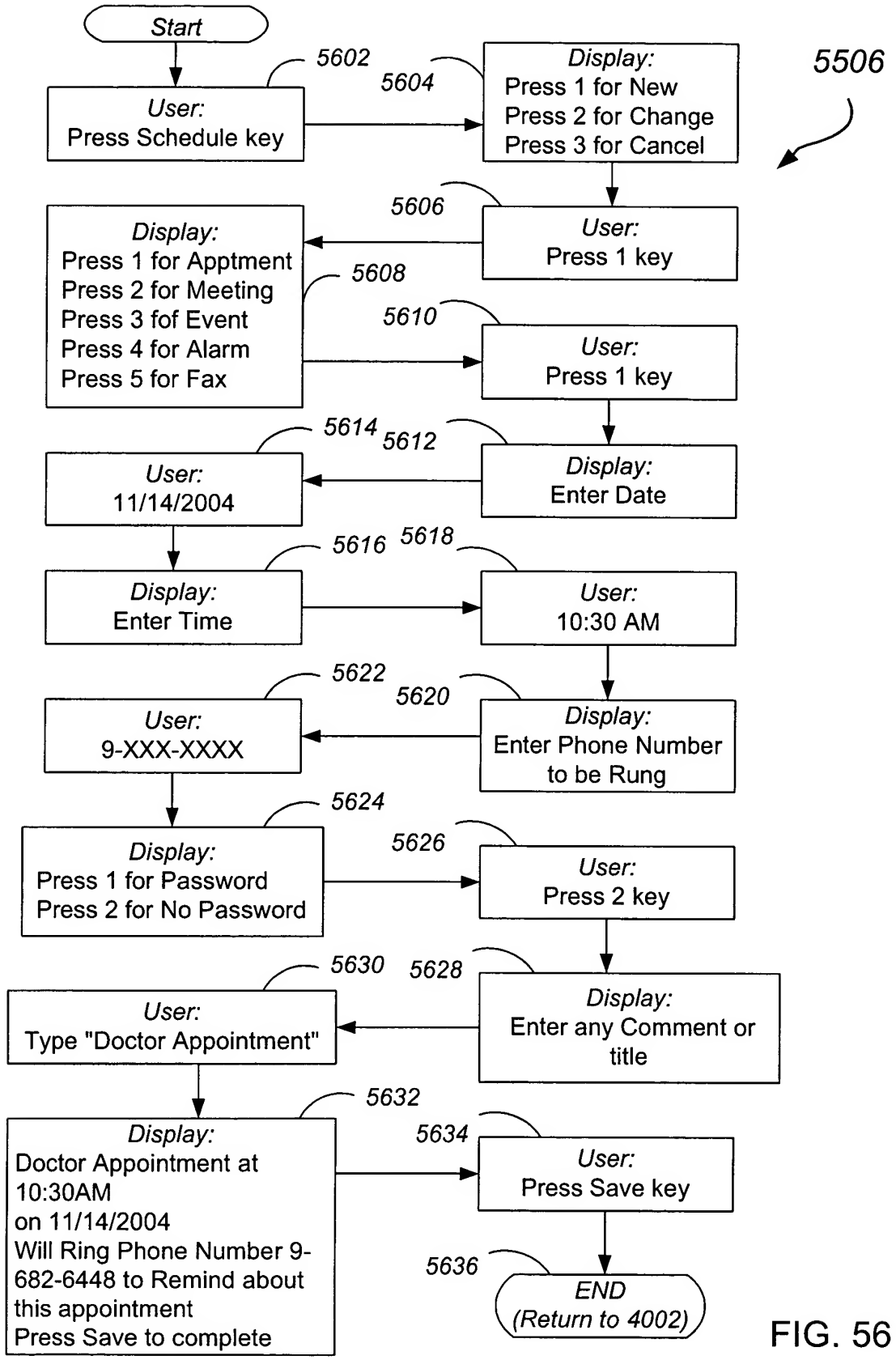

Start
5602
User:
Press Schedule key
5604
Display:
Press 1 for New
Press 2 for Change
Press 3 for Cancel
5506
5606
User:
Press 1 key
Display:
Press 1 for Apptment
Press 2 for Meeting
Press 3 fof Event
Press 4 for Alarm
Press 5 for Fax
5608
5610
User:
Press 1 key
5614
5612
User:
11/14/2004
Display:
Enter Date
5616
5618
Display:
Enter Time
User:
10:30 AM
5622
5620
User:
9-XXX-XXXX
Display:
Enter Phone Number
to be Rung
5624
5626
Display:
Press 1 for Password
Press 2 for No Password
User:
Press 2 key
5630
5628
User:
Type "Doctor Appointment"
Display:
Enter any Comment or
title
5632
5634
Display:
Doctor Appointment at
10:30AM
on 11/14/2004
Will Ring Phone Number 9-
682-6448 to Remind about
this appointment
Press Save to complete
User:
Press Save key
5636
END
(Return to 4002)

FIG. 56